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# THE AEROPLANE

Edited by C.G.Grey

WEDNESDAY, JAN. 5, 1921.

Vol. XX. No. 1.

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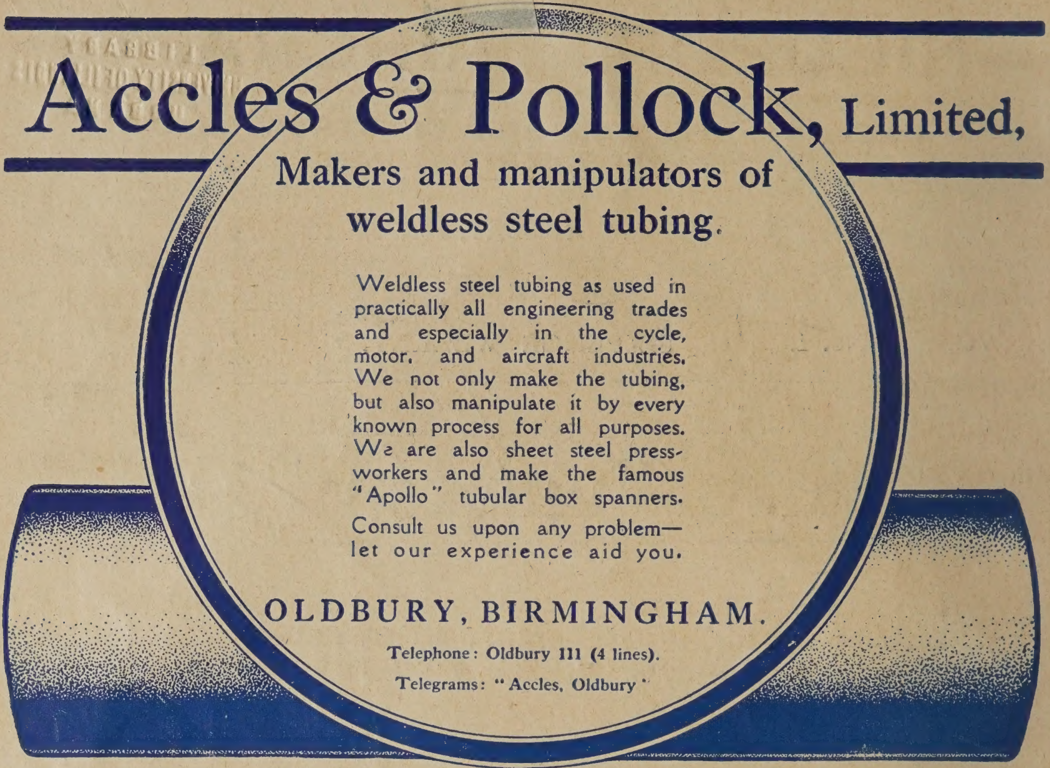

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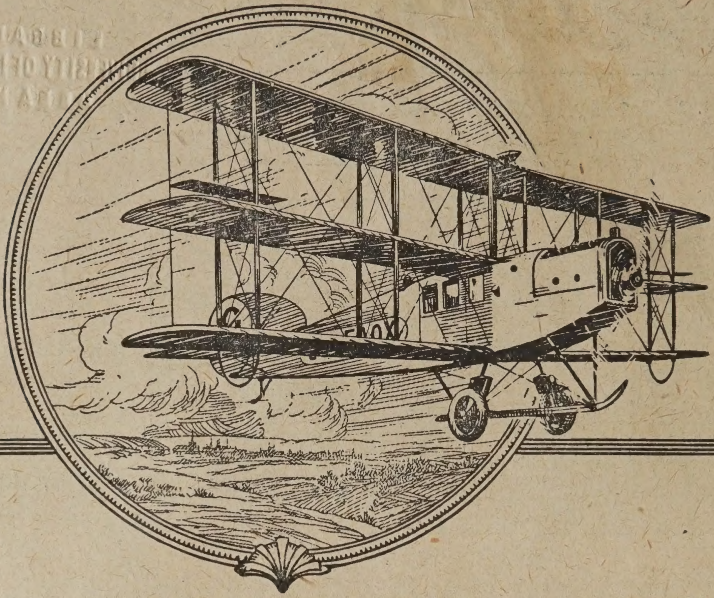

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# ON 1920.

As is the custom in this paper, the first article of the New Year is devoted to a review of the Old Year. Never during the nine and a half years of the existence of THE AEROPLANE has one written an obituary with so much pleasure as one writes that of 1920.

Everything in the scheme of Creation has its uses, even editors of daily papers; but it is at first sight hard to see what use the year 1920 has been to anybody. It is true that the year has certain achievements to its credit. The speed of the Martinsyde which won the Aerial Derby showed that we are making progress in this direction, and the speeds of between 190 and 200 miles per hour since achieved by one's good friends, Captain de Romanet on the Spad and M. Sadi Lecointe on the Nieuport, are still more encouraging. For it is well to remember that the record speed of to-day is the average travelling speed of to-morrow.

The performances of the commercial aeroplanes and more especially of the amphibians in the Air Ministry Competition at Martlesham were such as to prove that we are advancing in the production of commercial aircraft. This in itself is a big step in the right direction.

Also, the vast crowds which went to see the R.A.F. Tournament proved that the Great British Public is interested in aviation. The crowds, equally great, at the Buc Meeting in France and at the Pulitzer Trophy Race on Long Island proved that the French and American Public are equally keen on seeing good flying.

Furthermore, the really large quantities of goods and the very considerable numbers of passengers carried across the Channel with such wonderful regularity by the various air lines during the year prove that there is plenty of air traffic to be had if the money and brains are available to establish air lines on a commercial basis under competent management.

Nevertheless, despite all these indications of progress and signs of the possibilities for the development of Commercial Aeronautics, if we look at British Aviation as it is to-day, our air lines bankrupt or almost inoperative, no public flying being done to maintain popular interest, and most of our aircraft manufacturers living from hand to mouth, wondering whether to close down and whether they can pay their wages bill if they remain open, it is fairly evident that 1920 has been of little use to itself or to anybody else. Now that it is dead and damned we can look forward hopefully to better things in this year of grace 1921.

## The Great Slump.

Somewhere there is a phrase about "rising on our dead selves to better things"—one has never had the patience nor the industry to verify quotations. So far as one can judge, 1920 has been merely a stepping-stone between the unnatural War Boom, which taught us so much about the mere act of flying and hindered so much the development of aeroplane design, and the Peace Boom which is coming as soon as the present financial slump is over and a few real business-men take hold of the Aircraft Industry, more especially of the Air Transport branch thereof. Therefore 1920 may be written down in the history of Aviation as the Year of the Great Slump.

All industries, even in normal times, have their booms and slumps. And always the trough of the slump is a shade higher on the fever chart than is the peak of the last boom but one. Thus the level of the present slump is actually higher than that of what we thought to be a boom in 1914, at any rate so far as the output of aeroplanes is concerned.

For example, one is fairly sure that the Bristol Company's orders now in hand for aeroplanes and the Fairey Company's orders for seaplanes comprise a far greater number of such machines than either the R.F.C. or the R.N.A.S. ever hoped to possess at the beginning of 1914. And the orders in hand for Japan alone from Short Bros. and the Avro Co. are each greater than the total foreign trade of the whole Aircraft Industry in 1914. This is without counting Norwegian orders from the Supermarine Co., Chinese orders from Vickers Ltd., and sundry odd sample orders, such as Canadian orders from Martinsyde's, over and above which there is the big business which is being done by the Aircraft Disposal Co., Ltd.

If the Aircraft Industry at this time in 1914 had had as many orders in hand it would have thought that its fortune had been made. Similarly, if this paper had had in 1914 the number of advertisements and reading-matter pages that it has now it would have regarded itself as a triumph of technical publication instead of, as it does, as a relic of departed grandeur, hoping that some day it may revive its former glories.

## Our Errors.

Looking at the situation in that light, the present slump appears to be nothing very desperate. And in fact it would not be of much consequence but for the fact that the Aircraft Industry, like all other industries, has wasted its substance in riotous living.

That is to say it has spent all the money which were left to it by the gatherers of the Excess Profits Duty on high wages for slow workers. Nearly all the firms in the Industry engaged a year ago or more in vast schemes right outside aircraft work. If the men in the factories had really worked many of those schemes might have come to something great. But everybody was then suffering from war-fatigue or war-nerves, and not a man, from the managing director to the shop sweepers, ever did a man's day's work.

It is all very fine to blame the slackness of the workmen and their constant strikes for the present slump. To tell the truth, the men at the top were just as much to blame. They gadded about in large cars, spent their nights at expensive theatres, restaurants, and clubs, and consequently were incapable of doing a man's work next day. They did not strike, but they took long holidays, went shooting or fishing or for tours abroad just when they should have been working hard to put their businesses on a sound footing. Therefore we all, employers and employees, deserved the slump. And we have got it.

It would have been far better if all the aircraft factories had merely shut up and dismissed their hands. Then they could have kept a small experimental aircraft shop going until such time as air transport developed and the demand for aeroplanes arose. When it did so they would have had capital in hand to finance their work. As it is all their money has been spent and they have got nothing for it.

## Artificial Aids.

There is no doubt that the present state of affairs is largely artificial. A slump had to come after the false boom immediately after the war. History made that evident. And the sooner the slump came the sooner it would be over.

The great International Jew Financiers knew that perfectly well. And as soon as the boom—out of which they were of course making money—began to slacken they precipitated the slump. The Hidden Hand, which is not a German hand at all, but an International Hebrew hand, has simply ordered all the world's banks to stop lending money.

Any who doubt this theory are invited to read the last story of all in Mr. Kipling's "Puck of Pook's Hill," which was written many years before this war.

That means that all businesses which are not based on the strongest financial foundations are being shaken out of the market. The present financial stringency is nothing more nor less than a fine-mesh sieve. It is the best thing that can happen. It is the execution of Nature's first law, the survival of the fittest. And it is a demonstration of the Buddhist doctrine that "all things work together for good." Which is precious little consolation for those who go under in the fight for existence.

Meantime, the weak or badly managed firms go out of existence. Men and women of all classes are thrown out of work. Those who are still at work are forced to forsake their war-time luxury and to learn again to economise. The price of food, clothing, and labour is forced down. Which means that the value of money goes up. And, as usual, the Chosen People reap their golden harvest whether in boom or slump.

When the International Financiers have seen the slump go far enough they will release money again, and trade of all sorts will revive. It is merely a matter for all of us of hanging on till our financial task-masters set us free to use our industry again. At what time the turn of the tide may come is on the Knees of the Gods—in this case probably the Golden Calf. Personally, one is of the opinion that it will be a matter of months only, and not of years, before trade revives. The International Financiers are far too clever to allow a Slump to develop into a Cataclysm.—C. G. G.

*(To be continued.)*

# THE REVIEW OF THE YEAR.

## JANUARY.

**Military Forces of the Crown.**—It was announced in the first issue of THE AEROPLANE for 1920 that the King had conferred a Baronetcy of the United Kingdom on Air Marshal Sir Hugh Trenchard, K.C.B., D.S.O., of Wolfeton, in the County of Dorset, Chief of the Air Staff.

The British section of the Inter--Allied Aeronautical Commission began operations in Germany in this month, and besides destroying a number of obsolete war machines and engines, hindered considerably the progress of international aviation by forbidding or interfering with the construction of commercial machines.

It was stated on Jan. 7th that aircraft equipment to the value of £5,700,000, lately the property of the R.A.F., had been sold by the Disposal Board.

On Jan. 12th, the Air Ministry announced that the total number of all ranks demobilised up to Jan. 3rd were 26,087 officers, 21,258 cadets, and 227,229 other ranks.

On Jan. 16th an amended list of Prohibited Areas was issued by the Secretary of State for Air.

On Jan. 19th the Committee of the Royal Air Force Memorial Fund, under the patronage of H.R.H. Prince Albert, K.G., issued an appeal for financial help.

On January 22nd the Admiralty issued in the London Gazette a list of Naval Officers who had been removed from the Navy List on appointment to permanent commissions in the R.A.F.

On Jan. 24th the Air Ministry announced the appointments to the Educational Staff of the R.A.F. Cadet College at Cranwell.

**Civil Aeronautics at Home.**—The Department of Civil Aviation instituted the system of issuing "Notices to Airmen," on lines similar to the "Notices to Mariners" issued by the Admiralty.

It was announced that from Sept. 2nd, 1919, to Jan. 1st, 1920, Handley Page Transport, Ltd., had carried 618 passengers and 16,982 lb. of freight between London and Paris, and between Sept. 26th, 1919, and Jan. 1st, 1920, had carried 251 passengers and 25,883 lb. of freight between London and Brussels.

On Jan. 8th, Messrs. Parer and MacIntosh left Hounslow on a D.H.9 (Siddeley "Puma" engine), *en route* for Australia.

On Jan. 10th, official particulars were published concerning the issue of airworthiness certificates to commercial aeroplanes.

The composition of the new Council of the Institute of Aeronautical Engineers was announced on Jan. 14th

On Jan. 21st the Committee of the Royal Aero Club passed new rules for the tests for Aviators' Certificates.

At a meeting held at Cambridge on Jan. 21st, the "Cambridge University Aeronautical Society" was formed.

On Jan. 24th Capts. Broome and Cockerell left Brooklands on a Vickers "Vimy" (Rolls-Royce engines) intending to fly to Cape Town. This machine was chartered by the *Times* newspaper.

On Jan. 28th this paper published a letter to the shareholders of the Birmingham Small Arms Co., Ltd. (associated with the Daimler Co.) in which the Directors of that firm announced an amalgamation with the Aircraft Mfg. Co., Ltd. It is important at this date to note the phrase "It (the Airco) holds and, *if desirable*, can retain a unique position in all matters connected with aviation." The Airco is now in the hands of its Debenture holders.

**Foreign Aeronautics.**—The first French Aero Show since the War extended into the first week of 1920, and demonstrated the stagnation of French Aviation.

Attention was drawn in the first issue of THE AEROPLANE for 1920 to the progress of aviation in Japan.

It was recorded, also in the first issue of the year, that the U.S. Mail Service had covered by air during the month of September 56,744 miles, had made 170 trips out of a possible 172, and had carried 55,668 lb. of mail, representing 2,226,700 letters.

Holland announced that the Service aerodromes at Soesterberg and Schiphol would be available for civilian aviators.

It was announced that the U.S. Flying Services lost in the war 208 killed in action, 45 accidentally killed, 28 missing, 145 prisoners, 3 interned, 130 wounded in action and 25 injured by accident. A total of 584.

It was announced that in the American trans-Continental Race from New York to San Francisco and back, or vice versa, held Oct. 8th-Nov. 4th, 1919, the winner on flying time was Sec.-Lieut. Alex. Pearson with 48 hr. 14 min. 8 sec., and the winner on overall time was Lt. Belvin Maynard, with 2 days, 4 hr. 26 min. 5 sec. Both flew D.H.4 biplanes.

In January M. Flandin, himself a certificated aviator, was appointed Under-Secretary for Air in the Ministry of Public Works.

Much flying was done in Sweden in January by the pilots of P.O. Flygkompani, chiefly by Lieut.-Col. Henderson and Capt. Saunders on Faireys and Avros.

On Jan. 1st, Germany announced that 44 aeroplanes would be attached to the Public Security Police Force

On Jan. 7th this paper published the scheme of re-organisation of the French Service d'Aviation Militaire. It was also announced that during the War the French Service lost 1,945 pilots and observers killed, 1,461 missing, who were assumed killed, and 2,922 wounded, all in the Army zone. A further 1,927 were killed outside the Army zone. The full strength on Dec. 1st, 1918, was 12,919 men.

A miniature Aero Show was held at Chicago from Jan. 8th to Jan. 15th. There was talk of big orders, but no great result has since been reported.

On Jan. 9th the first of a number of Italian aeroplanes destined to fly to Tokio left Rome. Others, including the two ultimate arrivals, left on Jan. 19th.

It was made known on Jan. 14th that Mr. Frederick Koolhoven, the famous designer, had left the B.A.T. Co., Ltd., the moving spirit of which is Sir Sam. Waring, Bart, who obtained his baronetcy in connection with aviation, and had returned to the motor trade.

On Jan. 17th Lieut. Carminetti, one of Gabriele d'Annunzio's partisans, flew from Fiume to Paris in 7½ hours, dropped propagandist leaflets and was thereafter entertained at the Aero Club de France.

In THE AEROPLANE of Jan. 21st reference was made to Handley Page activities in the Argentine and in Poland.

**British Dominions Overseas.**—On Jan. 14th it was stated that the Indian Post Office proposed to maintain a weekly air mail service between Bombay and Karachi. After a week's trial the service was abandoned.

A table giving approximate air times between the chief South African cities and towns was published on that date.

Rules to control civil flying in India were issued in this month.

On Jan. 21st it was announced that a joint Naval and Military Air Board had been formed in Australia to control the Australian Flying Corps.

## FEBRUARY.

**Military Forces of the Crown.**—On Feb. 4th it was announced that Group-Capt. F. V. Holt, C.M.G., D.S.O., R.A.F., had been lent by the Air Ministry as Aeronautical Adviser to the Chinese Government.

On Feb 6th a letter was sent out by a group of former officers of the R.A.F. now in Rangoon endeavouring to collect others in Burma to form a Flying Services Association in that country.

On Feb. 13th the Air Ministry announced the formation of a School of Air Navigation at Calshot.

On Feb. 18th it was announced officially in the *London Gazette* that the R.A.F. had won its first war, when a mixed force of all arms under Group-Capt. Robert Gordon, D.S.O., R.A.F., with Wing-Comm. Bowhill as his Chief of Staff, defeated and utterly broke the army of the so-called Mad Mullah in Somaliland late in 1919.

On Feb. 21st three R.A.F. machines left Shotwick, Cheshire, to fly to Dublin. All disappeared, and no explanation of the mishap has ever been given. A steamship, the "Norfolk Range," reported that an aeroplane had been seen to descend in the sea 85 miles S.W. of the Scilly Isles, 2½ hours after the departure from Shotwick, and presumably this was one of the three.

**Civil Aeronautics at Home.**—On Feb. 4th a Vickers "Vimy" Bomber (Rolls-Royce engines) with Wing-Comm. H. A. Van Ryneveld and Flt. Lieut. C. J. Q. Brand as pilots, left Brooklands *en route* for Cape Town. It was the property of the South African Defence Force.

On Feb. 4th a D.H.14 (Napier engine), left Hendon *en route* for Cape Town, piloted by Mr. Cotton (late R.A.F.). This was a private venture.

On Feb. 6th a Handley Page biplane (Rolls-Royce engines) appeared mysteriously at Brindisi, having left Cricklewood some days before. It subsequently transpired that it was chartered by the *Daily Telegraph* to fly to Cape Town, and that was to carry Major C. C. Turner as the representative of that paper.

On Feb. 23rd the *Daily Mail* published a circumstantial account of the formation of "a strong syndicate of shipowners and airship constructors" to "investigate the possibility of running airships to the Continent, Africa, and the East." Nothing but talk materialised.

On Feb. 28th, in the course of a lecture at King's College, London, Mr. F. Handley Page made the first public announcement concerning the discovery of the now famous Handley Page wing.

**British Dominions Overseas.**—On Feb. 11th this paper published an account of the entire reformation of the Aero Club of Canada, which thenceforth came under the control of practical aviators, mostly with war experience.

On Feb. 1st Messrs. Parer and Macintosh arrived at Cairo *en route* for Australia.

The formation of Bishop-Barker Aeroplanes, Ltd., in Toronto, with a capital of $300,000, was recorded in this paper on Feb. 11th.

On Feb. 11th the South African Defence Force Vickers "Vimy" was forced to land by engine trouble and crashed near Korosko, 80 miles north of Wady Halfa. The engines were taken back to Cairo, put into another similar machine belonging to the R.A.F., and a fresh start was made on Feb. 22nd.

On Feb. 25th, an R.A.F. Vickers "Vimy" left Cairo *en route* for Cape Town, piloted by Major Welsh and Capt. Halley. It crashed on Feb. 27, near Korosko.

On Feb. 26th Mr. Cotton crashed his D.H.14 at Paola, in Calabria, *en route* to the Cape, through landing on an "official" Italian aerodrome which did not exist.

On Feb. 27th the *Times* Vickers "Vimy" crashed in trying to leave Tabora aerodrome in Central Africa, after suffering much from leakage from the water-jackets.

On Feb. 28th, the *Daily Telegraph's* Handley Page was forced to descend near Wady Halfa, owing to a defect developing in the air. The machine crashed in landing and the voyage ended.

**Foreign Aeronautics.**—On Feb. 6th Commandant Vuillemin, hero of the famous flight from Constantinople to Marseilles in the day, left Algiers in company with Lieut. Dagnaux, also of the French Army, on a flight to Timbuctoo, which was in due course accomplished.

On Feb. 7th an aerial post was inaugurated between Reval (Esthonia), and Helsingfors (Finland) by Lieuts. Emery and Swatridge (both late R.A.F.), in the Esthonian Service.

An outline of the Japanese Army's aeronautical organisation was published in this paper on Feb. 11th.

The formation of the Koninklijke Luchtvaart Maatschappij voor Nederland en Kolonien (the Royal Air Traffic Company of the Netherlands and Colonies) was recorded on Feb. 11th. The official formation took place on Oct. 7th, 1919. This firm has since done much to develop Dutch air traffic between Holland and England, Germany and Scandinavia.

On Feb. 14th two S.V.A. biplanes, piloted by Lieuts. Ferrarin and Masiero, left Rome for Tokyo. These were the only arrivals at the goal.

On Feb. 16th Mr. McMullin flew a D.H.9 from London to Prague in 10 hr. 20 min.

On Feb. 17th M. Casale on a Spad broke the World's Height Record by reaching 7,300 metres (24.000 feet).

On Feb. 27th Major R. W. Schroeder, on a Le Père biplane reached an altitude claimed to be 36,020 feet at Dayton, Ohio, U.S.A.

## MARCH.

**Military Forces of the Crown.**—On Mar. 8th the Air Estimates for 1920-21 were issued The personnel was estimated at 29,730 as against 150,000 for 1919-20. This was exclusive of those serving in India. The total sum demanded was £20,942,930, as against £53,773,850 in 1919-20. Of this sum £894,540 was allocated to Civil Aviation (the first vote of this nature), and £2,575,540 was allocated to Experiment and Research (also for the first time).

The Air Estimates were debated and passed on Mar. 11th.

The Annual Meeting of the W.R.A.F. Old Comrades' Association was held on Mar. 27th. Dame Helen Gwynne-Vaughan, D.B.E., lately G.O.C., W.R.A.F., presided. Over 400 members were present.

A particularly amusing list of appointments to the Most Excellent Order of the British Empire was published in the *London Gazette* of Mar. 30th, various people of little import receiving decorations for aircraft work while others whose services have been of outstanding merit have received no recognition.

**Civil Aeronautics at Home.**—An important article on the launching and handling of seaplanes was published in this paper on Mar. 10th.

Early in March the first of 40 Vickers "Vimy" commercial machines ordered by the Chinese Government made its trial trip at Brooklands.

On Mar. 5th a Blackburn "Kangaroo," piloted by Mr. Kenworthy, made a flight with goods from Leeds to Amsterdam via London. It was hoped that this might be the beginning of a regular service, but energy was lacking to continue it.

Also on Mar. 5th, Messrs. Barnard and Chattaway, on the Instone Company's D.H.4, flew from Nice to London between 07.20 and 16.30. The actual flying time for 900 miles was 7 hr. 7 min. (=128 m.p.h.).

On Mar. 15th (AEROPLANE of Mar. 17th) it was announced that the Aircraft Disposal Co., Ltd. (formed by Mr. F. Handley Page, Mr. Theodore Page, and Mr. Godfrey Isaac—of the Marconi Co.), had taken over the whole of the Air Ministry's surplus stock, of the value roughly of £100,000,000, for £1,000,000 (to be paid in instalments) plus half the profits, if any. The deal was "arranged" by the Imperial and Foreign Corporation, Ltd., and the selling agency was made over to Handley Page, Ltd.

On Mar. 21st, Mr. F. P. Raynham, flying the Martinsyde "Semi-quaver" at Martlesham attained an average speed of 161.434 m.p.h. in four runs over the measured kilometre course. A Royal Aero Club certificate was issued accordingly.

On Mar. 24th it was announced that Mr. Holt Thomas had resigned from the directorate of the B.S.A. Company, as the other directors of that concern had decided to discontinue the design and construction of aircraft by the Aircraft Mfg. Co., Ltd.

On Mar. 28th (Sunday) the Port of Croydon superseded Hounslow as the London Terminal Aerodrome. Major S. T. Greer (late R.A.F.) was appointed Civil Aviation Traffic Officer in command.

**British Dominions Overseas.**—On Mar. 1st the S.A. Defence Force "Vimy," piloted by Wing-Com. Van Ryneveld and Flt.-Lieut. Brand crashed at Bulowayo, when starting for Pretoria (the next stage). It was announced on Mar. 9th that a D.H.9 would be sent up from Cape Town so that they might continue their journey.

On March 10th this paper published the first précis of the Canadian air navigation regulations.

On the same date the formation of the new Aero Club of South Africa was recorded.

On Mar. 14th Messrs. Parer and MacIntosh reached Calcutta en route to Australia.

GREETINGS FROM INDIA.—N. 1 Squadron's Xmas Card, drawn by Mr. Geoffrey Watson.

The formation of a company to promote flying in the Bermudas and West Indies was recorded on Mar. 17th. This firm is a combine of A. V. Roe and Co., the Supermarine Co., the Beardmore Engine Co., and the Furness, Withy Steamship Co.

Wing Com. Van Ryneveld and Flt.-Lieut. Brand left Bulowayo on a D.H.9 (Siddeley "Puma" engine) on Mar. 17th and arrived at Cape Town on Mar. 20th, thus becoming the first to travel from London to Cape Town (or England to South Africa, or Cairo to the Cape) by air. They were later made Knights of the Order of the British Empire.

On Mar. 25th the Marconi Co. gave a demonstration of aeroplane "direction finding" by wireless to a distinguished gathering at Chelmsford.

On Mar.31st the D.H.18 (Napier engine) made its first trip to Paris. Piloted by Mr. Courtney, and with 8 passengers on board, it covered the distance in 1 hr. 57 min

**Foreign Aeronautics.**—On Mar. 10th this paper published notes of importance concerning the Flying Services of Czecho-Slovakia and Esthonia.

In the same issue it was recorded that General Dumesnil had been appointed Director-in-Chief of French Military Aeronautics.

The French Directorate of Aerial Navigation was placed under Col. Saconney, of man-lifting kite fame.

On Mar. 4th Lieuts. Ferrarin and Masiero were both at Karachi, en route to Japan.

On Mar. 5th the Compagnie des Grands Express Aeriens (Farman Frères) began their regular services of "Goliath" biplanes between Paris and London. It continued after British firms had ceased to operate.

During the week ending Mar. 6th, Mr. R. H. McIntosh flew a Handley Page from Madrid to London with only three stops—at Vittoria, Tours and Paris—in 13½ hours flying time.

At the New York Aero Show, held between Mar 6th and 13th, only seven firms were represented and only 14 machines were shown.

On Mar. 8th the first seaplane flight in the Belgian Congo mail service took place. French Lévy-lePen flying-boats form the equipment of the service.

A list of French official missions to sell aircraft to foreign nations was published on Mar. 10th.

In the same issue the election of M. André Michelin to be President of the Aero Club de France was recorded.

On Mar. 17th it was recorded that General Nagaoka has bought 300 Spad and Farman machines in France for the Japanese Army.

The whole of the "Regulations concerning the Grant of Subsidies to Air Navigation Companies in 1920 by the French Government" was published in this paper on Mar. 17th.

A trip in the German commercial airship "Bodensee" was described by Mr. Hildesheim on Mar. 24th.

On Mar. 25th Lieuts. Ferrarin and Masiero arrived at Rangoon, Burma.

On Mar. 28th Capt. Almonacid, of the Argentine Army, flew from Mendoza (Argentina) at 17.30 hr. and landed in the sea near Valparaiso (Chile) at 19.10 hr., having crossed the Andes.

On Mar. 31st Commandant Vuillemin arrived at Dakar having covered 3,500 miles of survey work over the Sahara Sesert.

### APRIL.

**The Military Forces of the Crown.**—On April 3rd it was announced officially that the Marquess of Londonderry, K.G., had been appointed Under Secretary of State for Air in place of Major G. C. Tryon.

On April 7th the Air Ministry issued regulations concerning the new full dress uniform for R.A.F. officers.

Extracts from Mr. Churchill's speech on the Army Estimates were published in this paper on April 14th and 18th, and important lessons were deduced from them.

On April 14th it was announced that Sir Charles Wakefield had offered a number of annual scholarships for competition among candidates for R.A.F. Cadetships.

On April 22nd it was announced that Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., had been appointed Parliamentary Private Secretary to Mr. Churchill.

On April 29th, a flying-boat engaged on instructional work crashed at Felixstowe, and Squad.-Leader Rowland Moon, D.S.O., R.A.F., the pilot was killed, together with Sub-Lieut. Fonseca, a Portuguese pupil, and Flying Officer A. J. Fyfield. Rowland Moon had distinguished himself by great gallantry in East Africa.

**Civil Aeronautics at Home.**—On April 7th this paper recorded the first flights of an aeroplane fitted with the new Handley Page wing.

The Post Office Estimates issued this month included £7,500 for conveyance of mails by air. This was the first mention of air mails in Postal finance. How the sum has been expended is not known.

The appointment of Dr. Leonard Bairstow, C.B.E., F.R.S., to be Professor of Aerodynamics at the Imperial College of Science and Technology, was announced on April 5th.

The death from illness of Professor Huntingdon, a pioneer of aviation, occurred on April 17th.

On April 19th, Mr. McMullin on a D.H.9 (Siddeley "Puma") arrived at Croydon from Prague, having covered the 700 miles in 7 hrs. 45 mins.

The conditions for the Air Ministry Competition for small, large and amphibian aeroplanes, to be held in August, were issued on April 20th, and published in this paper on April 28th.

**British Dominions Overseas.**—Much activity in South Africa was recorded in this paper on April 17th. An aerial business tour by the Dunlop Rubber Co.'s representative was one of the prominent features.

On April 1st an Aero Conference of delegates from all parts of South Africa met at Cape Town, when Service and Civil Aviation was discussed (THE AEROPLANE, June 16th).

**Foreign Aeronautics.**—The tests of the first Handley Pages in China were recorded in this paper on April 7th.

In the same issue it was recorded that the Aero Club of Italy had changed its name to La Federazione Aeronautica Nazionale Italiana.

On April 1st the first air mail service began in Spain, the route being Barcelona-Alicante-Malaga, which is a section of the French line from Fréjus to Rabat (Morocco).

On April 17th Capt. Mathews and Sergt. Kay, who had left England on Oct. 21st, the first of all the competitors to start on the flight to Australia, crashed and ended his flight at Singaruda, in the island of Bali, Dutch East Indies. He had covered 10,000 miles, and had 1,000 to go to reach Australia.

On April 21st Lieut. Masiero arrived at Canton, the first to land on Chinese territory in a flight from Europe.

The Monaco Seaplane Meeting, held towards the end of April, was very fully reported in this paper on April 28th and May 5th. The Meeting was distinguished by the fact that no British machines competed, though the big prize for the trans-Mediterranean Race would have been a gift to any of several British sea-going aircraft.

### MAY.

**The Military Forces of the Crown.**—The conferring of the K.B.E. on Lieut.-Col. Helperus Andreas Van Ryneveld and on Flt.-Lieut. Christopher Joseph Quintin Brand was gazetted on May 15th.

On May 20th H.M. Airship R.33 flew from Howden to Lympne and back at night to observe the effect of aerodrome light-houses. Soon after starting an aeroplane which had been attached below the ship was released with its engine running, to test a rubber-covered petrol tank in a crash.

On May 27th Air Commodore R. M. Groves, C.B., D.S.O., A.F.C., was killed while piloting a machine in Egypt. His passenger, Flying Officer C. O Bird, was also killed.

On May 26th the Air Ministry announced that £1,500 had been given by the Orange Free State Branch of the Victoria League to endow scholarships at Cranwell for South African candidates.

**Civil Aeronautics at Home.**—The terms of reference of the Government Aeronautical Research Committee were published on May 12th.

On May 4th Capt. G. T. Rowland Hill, flying a Handley Page W.8 (Napier engines), attained a height of 13,000 feet with a useful load of 1 ton 12 cwt. 3 qr. 12 lb. A Royal Aero Club Certificate was issued accordingly.

On May 11th the Marquess of Londonderry introduced the Air Navigation Bill in the House of Lords. This Bill, as now amended, is the basis of all the World's air law.

The unification of the interests of A. V. Roe and Co., Ltd., and Crossley Motors, Ltd., was announced on May 12th.

It was announced officially that on and after May 12th there would be two mail aeroplanes to Paris daily (at 09.30 and 16.30) instead of one. The price of letters was fixed at 2s. per oz. without express delivery.

On May 13th the Air Ministry issued an order prohibiting flights to India on account of the state of war in Syria and in Mesopotamia. This put an end to the competition for the £10,000 prize which had been offered by the *Daily Express* early in the year for a flight to India and back.

On May 17th the first regular air service between England and Holland was started. This was run by the Aircraft Transport and Travel Co., Ltd., in conjunction with the K.L.M. (the Dutch firm).

On May 31st Mr. Bert Hinkler, on a Baby Avro (35-h.p. Green engine), left Croydon at 04.50 and landed at Turin (Italy) at 14.20 the same day, having covered 650 miles on 20 gallons of petrol.

**British Dominions Overseas.**—The Canadian Air Board's official announcement of the formation of the Canadian Air Force was published on May 19th.

*(Continued on page 21.)*

# IN THE NEW YEAR.

There will be many interesting developments in the New Year. It is said, for example, that the British Government intends to subsidise British air lines so that they can compete successfully with the subsidised French air lines in the future. Also it is said that the British subsidy is to be paid on a system of "payment by results," a system of which some of our fellow-citizens do not approve.

The French system is a subsidy on mileage which is also "payment by results." It is in this case a wrong system, for it pays in France to use any old machine with any old engine, bought from "Disposals" at scrap prices. The cheaper the outfit the better it pays on the subsidy.

The British system is, so it is said, to be a payment on the basis of traffic receipts. That is to say the Government will pay the air lines a percentage on the money taken in passenger fares and freight charges. This is quite sound, for it encourages good business methods, and that truest of all economies a thoroughly reliable outfit of material.

Cheaply built or obsolete machines will be the worst form of economy for any British air line in the New Year, for the earning capacity of the air line will depend, firstly, on keeping all its machines in use for the maximum period, and, secondly, on giving users of the line confidence in the reliability and suitability of the firm's equipment of machines and engines.

## THE QUESTION OF RELIABILITY.

Now when the question of reliability arises, naturally anyone with any knowledge of the history of British aircraft naturally thinks of Fairey aeroplanes. When people recall the history of individual Fairey seaplanes, such as the old Number 10, which has been a Naval patrol machine, an experimental land machine, a pioneer amphibian, a racing seaplane, and a successful competition amphibian; or Lieut.-Col. G. L. P. Henderson's old seaplane, which started as a Naval two-seater, became a joy-ride seaplane in Sweden, was then turned into a four-seater passenger machine, afterwards became a snow-flier on skis, and is now a regular air-line machine inside the Arctic Circle; then they begin to appreciate what real reliability means in connection with aeroplanes.

Machines which have been through so many transmogrifications, and have never failed to do their work satisfactorily though all the material in them is years old, prove that Fairey aircraft are undeniably reliable.

## THE QUESTION OF SUITABILITY.

Reliability alone is not enough. An air-line machine may be wholly reliable and yet may not pay for its keep because it is unsuitable for its work. Where the Fairey aircraft are concerned there is no doubt about their suitability. Take these same machines mentioned in the previous paragraph. Whatever the job to which they have been turned they have proved their suitability for it.

Whether carrying passengers and baggage across the Baltic from Sweden to Finland, or racing at Bournemouth, or performing amphibian feats between Southampton Water and Croydon, or between Felixstowe and Martlesham, or flying off ice in Scandinavia, or flying off the decks of warships at home, the Fairey aircraft have always proved their suitability for their jobs.

## AT HOME OR ABROAD.

Undoubtedly, subsidies or no subsidies, it is certain that there will be much air line work done in the New Year both at home and abroad. On sheer performance there is obviously no aeroplane to-day which can beat the Fairey for reliability and suitability for air line work.

Do not forget that, as in most things aviatic, the Fairey has done pioneer work on air lines. It was a Fairey which did the pioneer work of running a newspaper air line from the Thames (Westminster Bridge) to the seaside resorts in the Isle of Thanet. It was a Fairey which did the pioneer work on the trans-Baltic air line from Stockholm to Helsingfors. It was a Fairey that pioneered the air line that will be some day along the coast of Spitzbergen.

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# AERONAUTICAL ENGINEERING

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## THE WEEKLY COMMENTARY.

In a retrospective note on the year which has just passed Captain Sayers draws attention to some of the brighter aspects of the aerial activities of 1920.

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A curious case of the simultaneous—or nearly simultaneous—discovery of the same fact by two widely separated individuals is instanced by the particulars which are given in this issue of the Kattler-Lachmann wing, which is practically identical with the Handley Page wing. The refusal of the German Patent Office to accept the application on the ground that they did not believe the wing would produce the effect claimed is interesting.

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A racing edition of the Loening monoplane which showed a very fine turn of speed in the recent race for the Pulitzer Trophy is described and illustrated on page 10.

## 1920.

The year which has just closed has been one to which all who are connected with aviation should look back with very mixed feelings. As far as can be discovered, however, there are few who do as they should, and the majority seem to regard it as a period of unmixed gloom.

1920 opened with the Paris Salon still in being—and that Salon was pervaded with an atmosphere of forced gaiety overlying a sense of profound pessimism. It was alleged to be the last dying kick of the French Aircraft Industry—and though it is true that since that Exhibition some of the French aircraft manufacturers have passed the ordeal of liquidation—yet there have since appeared new firms of French constructors, and the French Industry shows signs of a marked revival.

In England the year opened with higher hopes than were to be found in France; in its earlier months optimism was fairly well maintained. The Olympia exhibition of July was a manifestation of the capacity of the British Aircraft Industry.

### Facts, Depressing and Otherwise.

There has never been an exhibition of aircraft which showed so high a level of technical excellence and of high-grade workmanship—and there has probably never been one which attracted the general public so little. Yet the R.A.F. Pageant which shortly preceded the exhibition proved that the public were not uninterested in flying.

The real fact of the matter is that the public is interested in flying but does not regard it seriously as a commercial proposition. They will flock in their thousands to see flying stunts, but they do not regard aircraft as potential carriers of their persons or their goods, and they take no interest in the details of their equipment and their design.

The period since that exhibition has been marked by the closing down of more than one well-known firm of constructors, and by the cessation of the operations of Air Transport and Travel, Ltd.

The Aircraft Industry generally is oppressed by gloomy forebodings, and the generally expressed opinion is that aviation is, if not dead, at least to be dormant for some years to come.

And yet in many ways 1920 has been a year of great achievements—achievements which will be regarded in the future as marking an epoch in the development of aviation. The results of the operations of the British Air Transport concerns, unsatisfactory though they may have been financially, have nevertheless shown results which could scarcely have been expected. That machines of modified war types, running over routes presenting difficulties of climatic conditions almost unequalled in the civilised world, and practically devoid of properly organised navigational equipment, should have operated with the certainty, regularity, and safety which has actually been attained is adequate proof that the aeroplane can become one of the world's most important transport vehicles.

### Proof of the Practicability of Commercial Flying.

The past year's experience has proved definitely that in respect of reliability and controllability the aeroplane of to-day needs no startling or revolutionary changes to fit it for commercial services.

It has also proved that it is mainly in regard to cost of operation that the aeroplane stands in need of development. To some extent the financial failure of aerial transport in this country is to be traced to its introduction at a time of world-wide financial stringency, when every business firm is even more than usually loth to spend money on new methods of conducting that business. But to a much larger extent this failure has been due to the use of unsuitable and inefficient machines, which, in its turn, has been the inevitable result of the enormous stocks of surplus war-produced engines and aircraft, coupled with the difficulty of finding the necessary capital for the production of properly designed commercial craft. Had trade and industry generally been at a normal level of prosperity during the last few months, aerial transport would have paid handsomely, even running with the present far from satisfactory material equipment. Within a very short time it should be possible to provide such equipment that even in the present depressed state of affairs such transport will prove a commercial success.

### The Technical Activities of 1920.

For if 1920 has been financially an unsatisfactory year for the Aircraft Industry, it has been a year of great technical advance.

The technical journals devoted to aeronautics and allied subjects have, it is true, considerably decreased in volume of late, but the nature of their contents has changed vastly. During the war, and till late into 1919, they were filled with heavily censored statements of fact mingled with much unintentional fiction. During 1920 they have largely been filled by intelligent discussion of the immediate and the future possibilities of the art of aviation by constructive considerations of the economics of aerial transport, by essays upon the design of commercial aircraft, upon the equipment of aerial routes, and similar valuable matter; and their readers to-day are accustomed to thinking of the problems of aviation in commercial terms.

It is unfortunately only too true that very few of the other inhabitants of the earth are similarly accustomed, but that anyone should so think is an important advance. And from the habit of thinking of aircraft in commercial terms there have sprung the possibilities of producing aircraft of increased commercial value.

For the fact that two years elapsed from the end of the war till such time as the aircraft designers of this country have reached a stage where they can attack the design of commercial aircraft with some degree of certainty it is necessary to blame the virtual monopoly of aeronautical research which was acquired by the Technical Departments of the Air Forces during the war. In some respects this monopoly, obstructive though it has been up till now, seems likely to produce very excellent after-results. For—to take an instance—the N.P.L., in virtue of its war experiences, is firmly convinced that it and it alone knows all there is to be known about wing sections, and has complacently decided to devote all its attentions for the next year or two to a study of the problems of stability and control.

### An Opportunity for Private Enterprise.

It has thus left research into wings to private enterprise, and the result is to be seen in the appearance of the Handley Page and Alula wings—wings which it seems fairly safe to predict will be followed ere long by others which promise similar, if not greater, possibilities of increasing the ton-miles per horse-power-hour of the commercial aeroplane.

And thus the aeroplane designers of 1921 have very fair chances of adding to the proved sufficient control and stability qualities of the existing aeroplane the economy of operation which is all that is needed to make aerial transport the paying proposition that at present it is just not.

And by the time the Aircraft Industry can again afford to spend a fair amount of money on experimental work the N.P.L. will probably have arrived at some new results affecting stability and control which will call for practical exploitation and development.

In the history of the application of engineering science to the purposes of commercial undertakings there will be found innumerable cases where some new and startling development has roused the interest and the hopes of the world at large. These developments usually arouse expectations which cannot at once be realised, and there has usually been a period of depression following the preliminary excitement. In some cases that period of depression has been barren of new discoveries or of any progress—and when this has occurred the particular development concerned has generally slumped for good. But in many cases it has been precisely that period of deep depression which has seen the greatest technical progress in the art concerned, and whenever such a slump, following a period of public excitement, has been attended by such sound development, the art has after the slump progressed slowly and steadily to a sound business footing.

### A Certain Sign.

That 1920—a year financially most disappointing to the Aircraft Industry—should have been marked by steady technical progress is the most certain sign of the ultimate soundness of the art and science of aviation.

This is perhaps not a very satisfying reflection for those who are now feeling the direct results of the last years of depression, but it is at least something that one should be able to feel such an assurance.

The way of the pioneer is even harder than that of the transgressor, but so long as he is assured that his work will lead eventually to results the true pioneer will persist. For those who started 1920 in the belief that aviation called for no more pioneer work there is little to console them for their error—unless it be that they have unwittingly helped along better men than themselves.—W. H. S.

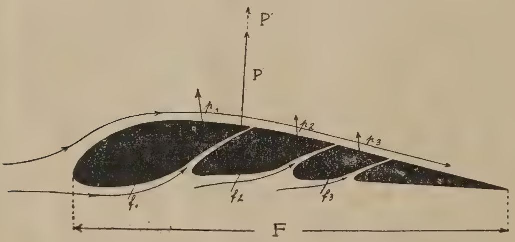
## THE KATTLER-LACHMANN WING.

The following article and illustrations are taken, with thanks, from that excellent German technical paper "Flugsport," of the date Dec. 22nd, 1920 :—

In our 23rd number we mentioned the new wing of the Handley Page Co. We learn that already in February, 1918, Herr Otto Kattler, of Darmstadt, applied for a patent on behalf of the inventor, Herr G. Lachmann, Darmstadt, for a similar invention.

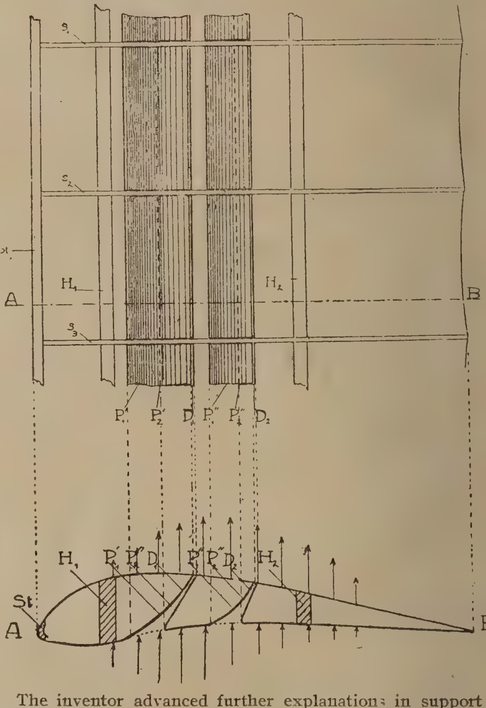
The patent claim is as follows :—

> Aerofoils, the profiles of which consist of several stepped and separate blind-like parts, and the invention is based on the following considerations :—
>
> The lift of a cambered wing moving through any medium at an angle of attack consists of a positive pressure on the under side and a negative pressure on the top surface. The invention in question tends to increase the lift of a wing, and for this purpose the high profile F of the wing is divided up into sections f1, f2, f3 (Fig. 7).
>
> The gaps between the wings are convergent in form, the narrow end being towards the top surface. The suction effect of the air flow passing the narrow openings on the one hand and the effect of the negative pressure on the top surface, on the other hand, tend to draw air from below past the cambered sections of surfaces. In this way are obtained the new values of pressure, p1, p2, p3.



> Thus the total head resistance of the wing W is the sum of the fractional pressures p1, p2, p3, and so on, and of the total resistance p of the large F in itself.
>
> Naturally this will be lower than the resistance p of an undivided wing.
>
> Fig. 2 shows diagrammetically how the idea described above could be applied to a modern wing. In each interval between the ribs are fitted in sequence two cambered plates of ply-wood, sheet metal, or cellon, etc.
>
> By giving a suitable outline to the plates the air-flow passes to the lowest profile curve with a minimum of eddies.

The Patent Office refused the application as the increase in lift claimed by the presence of gaps could not be accepted without further proof. It was contended that even if the state of low pressure prevailing over the wing were continually renewed, the passage of air through the slits would effect a decrease in the pressure.



The inventor advanced further explanations in support of his theory :—

The vacuum over the top surface is not stationary as would occur in a cavity from which all air had been pumped and which can be filled again by a flow of air. The negative pressure on the top surface is due to the rapid forward motion of the aeroplane, therefore, in a certain measure it is being formed anew at every moment, and cannot be neutralised by the slits, as the flow of air passing over the top surface restores the old condition of rarefaction immediately.

As a practical example, the well-known fact that the aerodynamic efficiency of a wing depends only in a subsidiary measure on the air-tightness of the fabric covering can be advanced. It is quite possible to fly with non-air-tight fabric, provided the surface be smooth.

According to the judgment of the patent examiners this should be impossible as a neutralisation of the pressure would occur through the fabric.

Appeal is being made against the refusal of a patent and the matter is still pending in the Appeal Department of the Patent Office.

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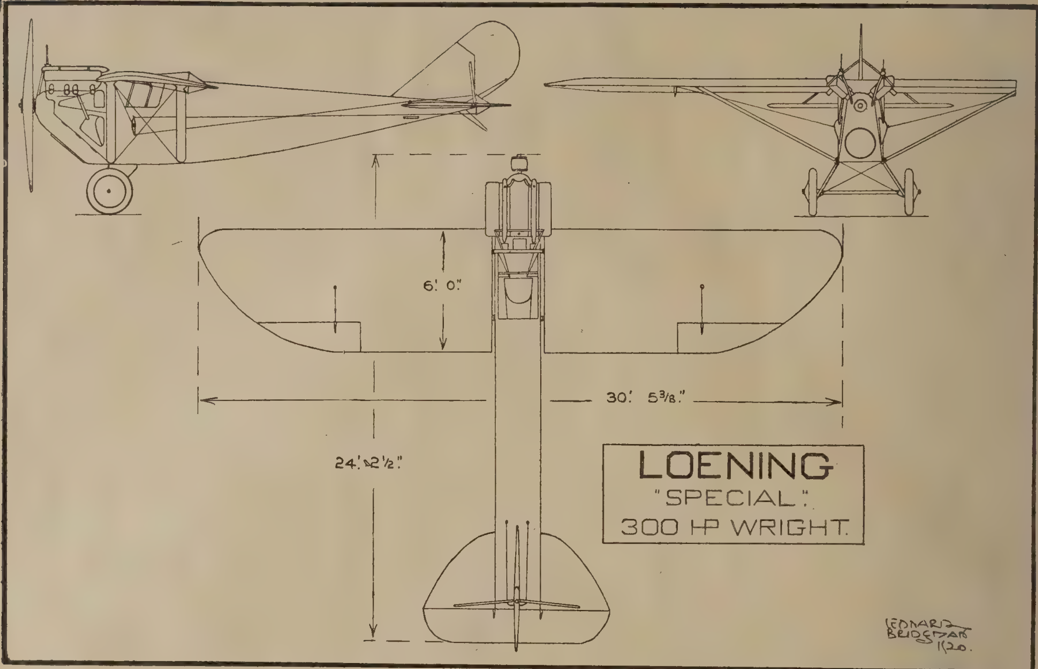
# THE LOENING SPECIAL RACING MONOPLANE.



A machine that created quite an impression in the recent Pulitzer Trophy Race was a Loening Special monoplane piloted by Lieut. B. G. Bradley, U.S. Marine Corps. It was entered by the U.S. Navy, and after covering almost the entire course at a speed of from 155-160 m.p.h. was compelled to retire about a mile from the finish owing to a broken water-connection which occurred whilst on the third lap, otherwise it would most certainly have finished somewhere between the first and fourth machines.

The fuselage is very deep forward and tapers to a horizontal knife-edge aft. The engine, a 300-h.p. Wright-built Hispano-Suiza, type H, is mounted in the nose, high up, both the cylinder blocks being exposed above the cowling. The radiator is mounted below the engine, the air reaching it through an oval opening in the cowling in a manner similar to that found on the Napier-engined D.H.16, D.H.18, and Fairey 21. Two streamline water expansion tanks are carried above the cylinder blocks.

The wings are attached to the fuselage by pin-joints, the wing spars passing right through from side to side, the short front and rear spars which correspond to those usually found in the centre-section of a biplane form two cross-members between the top fuselage longerons.

The pilot is seated in the fuselage between these two members, with his head just protruding above the fuselage. To improve his vision two openings are cut in the sides of the fuselage under the wings.

The wings have been considerably reduced in size as compared with the standard two-seater Loening monoplane, and the trailing edges have been cut away towards the wing tips, as shown in the scale drawing. Ailerons of small area are controlled more or less directly, the control cables running from the lower end of the joystick direct to a point on the front spar directly in advance of the aileron control bloaters, passing round pulleys to the under surface of the ailerons. The compensating cable runs from the upper side of each aileron rim inside the wing just aft of the front spar.

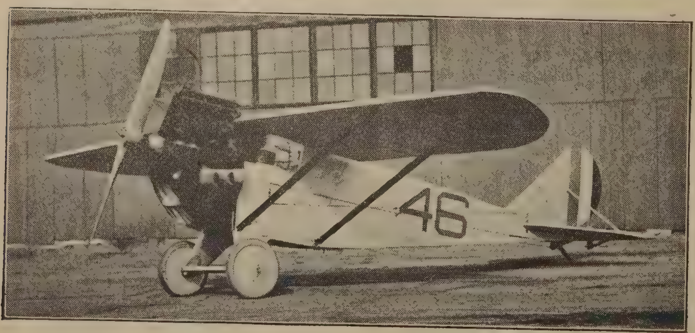
The wing struts are not of the lifting variety as used on the two-seater version. but are ordinary faired steel tubes, and run from the lower longeron of the fuselage to a point 6 ft. 8 3/16 in. from the body, leaving an overhang of 7 ft. 6 in. on either side.

The tail unit is standard Loening practice, consisting of a divided tail plane, single-piece elevator, fin and balanced rudder.

The undercarriage is very low and consists of two vees, the intervening space of which is faired, carrying an axle on rubber suspension. The tail skid is hinged to the rudder post.

SPECIFICATION.

| | |
|---|---|
| Wing span | 30 ft. 5⅜ in. |
| Overall length | 24 ft. 2½ in. |
| Chord of fixed tail planes, | 3 ft. 8½ in. |
| Span of tail | 8 ft. 10 in. |
| Weight (with water) | 1,450 lb. |
| Weight per sq. ft. | 12.5 lb. |
| Area of wings | 148 sq. ft. |
| Area of fixed tail plane | 16 sq. ft. |
| Area of fin | 7 sq. ft. |
| Chord | 6 ft. |
| Height (at wings) | 6 ft. 7 in. |
| Chord of elevator | 1 ft. 8 in. |
| Wheel track | 4 ft. 7 in. |
| Weight (loaded) | 1,850 lb. |
| Weight per h.p. | 5.5 lb. |
| Area of elevator | 14 sq. ft. |
| Area of rudder | 6.5 sq. ft. |



**Three-quarter front view of the Loening Monoplane (300-h.p. Wright-Hispano) which flew in the Pulitzer Trophy Race.**

# VICKERS

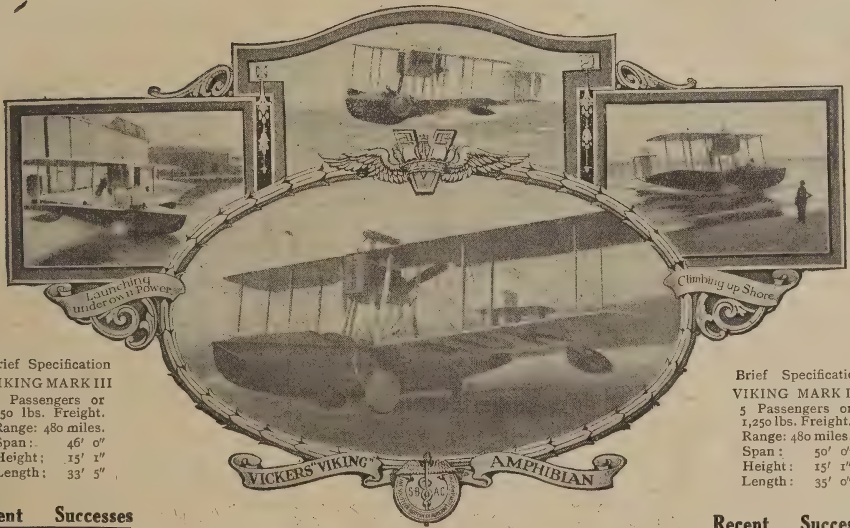
## LIMITED.

Telephone :
Victoria 6900.

Telegrams :
Vickers, Vic, London.

**Aeroplanes for Commercial and Military Use.** **Vickers-Saunders Flying Boats.**

**Flying Boats for Commercial & Naval Use.**



Brief Specification
VIKING MARK III
5 Passengers or
750 lbs. Freight.
Range: 480 miles.
Span: 46′ 0″
Height: 15′ 1″
Length: 33′ 5″

Brief Specification
VIKING MARK IV
5 Passengers or
1,250 lbs. Freight.
Range: 480 miles.
Span: 50′ 0″
Height: 15′ 1″
Length: 35′ 0″

**Recent Successes**

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

1. Shortest time in "unsticking" from water.
2. Fastest time over a given circuit.
3. Climb to 1,000 metres.
4. Altitude with full load.

Depôts :

**MANCHESTER**—Cathedral House, Long Millgate (Temporary Address).
**BIRMINGHAM**—Vickers House, Loveday Street.
**NEWCASTLE**—Commercial Union Buildings, Pilgrim Street.
**GLASGOW**—Vickers House, 247, West George Street.
**BRISTOL**—55, Park Street. **BELFAST**—26a, Arthur Street.
**LEEDS**—Greek Street Chambers, Park Row.
**NORWICH**—16, White Lion Street.

**Recent Successes**

The Vickers Viking was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION September. 1920.

Aviation Department,
VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

## AIR MINISTRY NOTICE TO GROUND ENGINEERS.

No. 17, 1920:—AIR NAVIGATION DIRECTIONS AMENDMENTS: AUTHORISED PATTERNS OF LOG BOOKS TO BE USED.

It is hereby notified: Section V of the Directions issued by the Secretary of State for Air under the Air Navigation Regulations, 1919, and dated April 10th, 1919, (Air Navigation Directions I) is cancelled, and the following provisions are substituted therefor:—

V. LOG BOOKS.

1. The authorised patterns to which the log books shall conform in all essentials in accordance with paragraph 3 of Schedule V of the Regulations, are respectively the Journey Log Book (C.A. Form, 26), the Aircraft Log Book (C.A. Form 27) and the Engine Log Book (C.A. Form 28), published by His Majesty's Stationery Office.

2. The log books shall contain all the information and particulars provided for in the authorised patterns referred to in the preceding paragraph, and the Instructions for Use set out in the authorised patterns shall be complied with. The Sections of the journey log book headed "Navigation Log" need not, however, be fully entered up except when a navigator is carried on the aircraft, provided that in all cases sufficient details are entered in the column headed "Route" to enable the route followed by the aircraft to be clearly identified.

For the purpose of this paragraph the term "repairs" shall be deemed to include all overhauls, replacements, repairs and work of a like nature.

3. The constructor shall fill in and sign the original entries in the log books as far as he is in a position to do so, Subsequent entries shall be made and signed

(a) in the case of the journey and signal log book by the pilot, unless there is a commander of the aircraft other than the pilot, in which event the entries shall be made and signed by such commander;

(b) in the case of the aircraft and engine log books by the ground engineer; provided that as regards matters which could not have come to the notice of the ground engineer, the pilot shall be responsible for making and signing the entries.

4. All entries shall be made in ink, except in the case of journey and signal log books. The entries for these may be made in pencil in a rough notebook, but shall be entered in ink in the log book every twenty-four hours. In the event of any official investigation the rough notebook may be called for.

5. No erasures shall be made in, nor pages torn from, any log book.

*Air Ministry*, December 29, 1920.

## MORE JOURNALISTIC ACCURACY.

The *Morning Post*, December 29th, in an article entitled "Air Telephony," refers to important developments in the art of aerial wireless telephony which have been made since the Armistice, and refers specifically to the prospect that duplex telephony to aircraft—i.e., both sending to and receiving from aircraft without switching over—will shortly be realised.

Referring to the difficulties encountered during the War the *Post* has gone somewhat astray as to the facts, and states that, during the air raids over London ". . . our ground stations could only warn our aeroplanes of the approach of the enemy, but could not receive an answering message from the aeroplane."

Almost the exact contrary was the case. Transmission from the aeroplane to the ground was developed to a very high degree of effectiveness some long time before the Armistice, but reception in the air from the ground presented much greater difficulties.

Further, as far as can be definitely ascertained, telephony was not used between ground and air during any raid on London, though had any raid later than that of Whit Monday morning, 1919, taken place, the wireless telephone would almost certainly have been used by the London Air Defences.

## A TEXT BOOK OF WIRELESS TELEPHONY.

TELEPHONY WITHOUT WIRES. By Philip R. Coursey, B.Sc.

This book represents one of the few attempts that have been made to prepare a concise account of the various stages of development that have resulted in the recent achievements of practical wireless telephony. The primary aim of the author—to compile a useful work of reference on past achievements in this branch of science—involves the inclusion of a few introductory chapters dealing with early methods which may now be regarded as quite obsolete.

These refer to the first systems of wireless telephony which employed the principles of conduction and induction, and light wave transmission, which to-day possess no practical utility in this particular sphere. Without decrying their value in a work of this nature, the same remark may be applied to the two chapters dealing with "Spark" generators of discontinuous waves and forms of quenched spark-gap.

Whilst the book contains an amount of valuable and interesting information on the development of arc oscillation generators, its value as a work of reference will speedily decrease because of the comparatively scanty treatment that it affords to the development of the thermionic valve as a generator of high-frequency oscillations, in its application to wireless telephony. Amongst the mast informative chapters are those dealing with frequency raisers, microphones and microphonic control. The book is profusely illustrated throughout and, although by no means exhaustive, should serve as a useful source of reference to the wireless engineer.

# TRADE NOTES.

## ROLLS-ROYCE.

The following cable was received on Dec. 14th last by Rolls-Royce, Ltd.:—

"King Albert visited Rolls-Royce Stand at Brussels Automobile Salon to-day. His Majesty expressed his great satisfaction with his Rolls-Royce car, which he has used since 1915, stating that it was still as good as when new. His Majesty also praised very highly the Rolls-Royce aero-engine, fitted to his private aeroplane, and displayed considerable interest in the model which is exhibited of the Vickers-"Vimy"-Rolls-Royce aeroplane which made the first direct flight across the Atlantic."

[The aero-engine referred to is the 275-h.p. "Falcon" Rolls-Royce in the King of the Belgians' private Bristol "Tourer" recently presented to him by Handley Page, Ltd.]

## CELLON DURABILITY.

The following letter was sent recently by the Fairey Aviation Co., Ltd., to Cellon (Richmond), Ltd.:—

Dear Sirs,—*Re* Fairey No. 10 seaplane, the following particulars of the machine will probably interest you, having regard to the fact that Cellon dope alone was used in its construction.

The machine was designed in the year 1916, delivered to the R.N.A.S. in April, 1917, and used in Service until the Armistice. This company in May, 1919, acquired her from the Disposals Board, and she was equipped for the purpose of conveying the *Evening News* from London to towns in Thanet, the machine getting off from and landing on the river at the Thames Embankment.

Following this, in the summer of 1919, she was used by us for experimental purposes and was subsequently converted and flown in the Schneider Cup Race in September of that year. In the early part of 1920 she underwent further experimental work with amphibian undercarriages and was used for ferry-work between Southampton and Sheerness in that year.

In all, nine different engines have been fitted to this machine, and in September, 1920, she competed in the Air Ministry Competitions for Amphibian Machines, her performance being equal to that of the most modern flying-boats.

From the time this machine was delivered to the R.N.A.S. in April, 1917, until now no single component part except the undercarriages has been replaced. Fuselage, wings, tail-plane, rudder, elevators, fin, tail-float, even the engine bearers are those originally fitted. The wings have been re-covered once, but the tail unit still has the original fabric.

The dope used throughout was of your make, and we have pleasure in stating that it has given the utmost satisfaction.

(Signed) THE FAIREY AVIATION CO., LTD.
Per A. A. AMOS (Secretary).

## REGISTERED COLOURS FOR AIRCRAFT.

Mr. Charles V. Allen, secretary of the Society of British Aircraft Constructors, Ltd., informs one that, in connection with the registration of colours for commercial aircraft, originated in 1911 by Mr. A. J. A. Wallace Barr, of Cellon (Richmond), Ltd., the Society has had the idea under consideration for some time past. The general ideas are down in black and white and the scheme will shortly be announced.

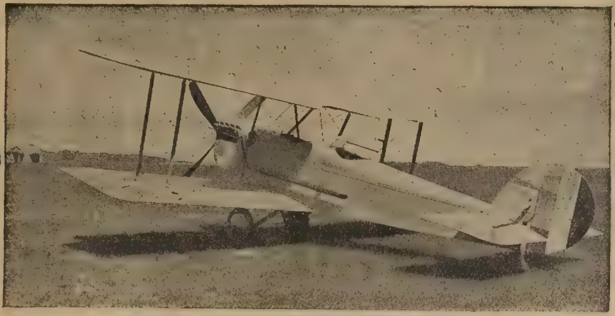
It was stated in the previous note in THE AEROPLANE dealing with this point that the Air Ministry had standardised on aluminium-coloured dope. One now learns that they have decided to adopt aluminium or/and brown for day work and black for night.—G. D.

## S. SMITH AND SONS (M.A.) LTD.

Apropos the new licensing regulations that came into force on Jan. 1st for all classes of motor vehicles, it is of considerable interest to note that S. Smith and Sons (M. A.), Ltd., have received an order from the Metropolitan Police for licence holders to be fitted to all their cars, lorries, vans, and motor-cycles.

## NEW COMPANY.

CONTROLS, LTD.—Private company. Registered Dec. 23rd. Capital, £1,000 in £1 shares. To carry on the business of makers of and dealers in flexible wire and rod controls, throttle and ignition controls for internal-combustion engines, gear and brake controls for automobiles, motor and other cycles, aircraft, ship telegraphs and switchboards, mechanical, electrical and consulting engineers, etc. The subscribers (each with one share) are: W. Mair Rolph, 68, Piccadilly, W., engineer; F. Hay, 9, Lincoln's Inn Fields, W.C., solicitor. W. M. Rolph (director of Hatchett's White Horse Cellars, Ltd., Simms Motor Units (1920), Ltd., Standard Insulator Co., Ltd., and Gerrett and Co., Ltd.) is permanent governing director, with £200 per annum as remuneration. Secretary: L. S. Thompson. Registered Office: 66, Piccadilly, W.



THE BOULTON & PAUL—P.9.

# AN AEROPLANE WHICH YOU CAN PURCHASE AS EASILY AS IF YOU WERE BUYING A CAR.

In this P.9 Machine we have, we feel, solved the problem of providing an Aeroplane which is a sound business proposition—and which combines with low cost the great essentials for Commercial and Private use. All our great resources of material and craftsmanship have been utilised. Scientific Research and Experiment by a staff associated with flying from its beginnings coupled with the great Experience gained through the building of thousands of Aeroplanes during the War, have been concentrated in the production of this P.9 Model.

It is a Two-Seater—Single Engine Tractor—which has attained on test a speed of over 100 miles per hour.

Its outstanding features are :—

**CHEAP AND EASILY HOUSED** The Initial cost is extremely low, and the cost of running for a machine of this type and performance is reduced to a minimum. Owing to its small size it is easy to handle on the ground and requires but little accommodation. The principal dimensions are : Span, 27 ft. 6 in. ; Length, 25 ft. ; Height, 10 ft.

**EASY TO FLY.** The P.9 has a very large speed range—enabling it to be landed in an extremely small area with ease. The well-balanced controls and excellent stability allow the machine to be flown for long periods without undue fatigue to the pilot.

**COMFORT AND CONVENIENCE.** The comfort of the Pilot and Passenger has been specially considered. Each Cockpit is roomy and fitted with our special seats. Controls for both Flying and Engine are fitted in the front and rear Cockpits to enable the machine to be flown from either position The exhaust from engine is discharged behind the rear Cockpit giving a silencing effect and freedom from fumes. Two standard cases are provided for luggage and form part of the fairing immediately behind the rear Cockpit.

The uses to which this compact and efficient machine can be put are wide and various, and will suggest themselves to those who have been awaiting the stage of Aeronautical Development now reached by the P.9. It can be used for dozens of Commercial Purposes. The same type carried photos from R.34 direct to London. It has been sent to Australia for Sheep-runs—and will soon be in use in various parts of the world for Exploring Uncharted Territory, Examining Timber Tracts, Fighting Forest Fires, Carrying Mails to Distant Mines, Transition of Colonial Mails to Mail Steamers, and for General Patrolling and Police Purposes.

**If you are interested—write for full particulars and prices. State your needs or purpose, and our engineers will consider every detail closely—to advise soundly.**

BY APPOINTMENT

**Boulton & Paul Ltd.**

**HEAD OFFICES & WORKS : NORWICH.**

**London Office Address : 135-137, Queen Victoria Street, E.C.4.**

# THE BRITISH DOMINIONS BEYOND THE SEAS.

## AUSTRALIA.

### Appointment of Civil Controller.

It has been stated that Col. Brinsmead (late Australian Flying Corps) has been appointed to hold the post of Controller of Civil Flying by the Federal Government.

Col. Brinsmead enlisted as a private in the A.I.F. and was gazetted to the 24th Infantry Battalion before leaving Australia. He served in Gallipoli and at Pozières as Adjutant, but was badly wounded at Pozières during the second Australian attack, and after nine months in hospital was discharged as unfit for further active service. He then applied to join the R.F.C. and was sent to the Senior Staff Officers' Course at Cambridge in the spring of 1917, where he came out first. Thereafter he was appointed a Staff Officer of the Australian Flying Corps in England.

After the conclusion of hostilities he acted as the Asst. Adjutant-General's representative with the British Peace Delegation at Versailles, having charge of the Prisoners of War Section.

There has been considerable agitation in Australia to have Civil Aviation organised on a sound basis, and Col. Brinsmead's appointment will be accepted with great satisfaction, particularly from the late members of the A.F.C., who were in a position to appreciate the good work of Col. Brinsmead during the war.

### Capt. W. H. Stutt Missing.

From a question asked in the Australian House of Commons it appears that Capt. W. H. Stutt and his machine are missing. A very comprehensive search has been carried out by both the Navy and Air Service. H.M.S. *Platypus* and Major Anderson on an aeroplane equipped with wireless are searching together. The fact that a thoroughly systematic search of the coasts of Victoria and Tasmania have been made seems to indicate that Capt. Stutt was attempting to fly from Australia to Tasmania.

Capt. W. H. Stutt will be remembered as a pupil, and subsequently an instructor and test pilot, at the Bristol Schools at Salisbury Plain and Brooklands back in 1912-13. His many friends in this country hope to hear soon of his return to civilisation.

### Aircraft in the Australian Parliament.

On Sept. 29th Sir Granville Ryrie, in reply to Mr. Gregory, said that it was the intention of the Air Council to experiment as to the feasibility or otherwise of letting contracts for the conveyance of mails by air, as it is thought advisable to test the matter by the Air Service on a given route before allowing civil aviation firms to embark on schemes for carrying mails.

### A New Company.

Under the title "Northern Territory Aerial Services, Ltd.," a new company has been registered with headquarters at Winton (North Queensland). The organisers of the new company are Lieuts. Hudson Fysh, D.F.C., and P. J. McGinness, D.F.C., D.C.M., the total capital being £100,000, half of which will be called up immediately.

### Victorian Aerial Derby.

It has been reported from Melbourne that Lieut. Parer, A.F.C., who, with Lieut. MacIntosh, flew from England to Australia, has won the Victorian Aerial Derby.

## CANADA.

### Aerial Surveys.

The Canadian Air Board have prepared a mosaic of the experimental survey of Ottawa and district, which has now been turned over to the surveyors to work out for comparative results and endeavour to allow for the necessary corrections so that, if possible, the problem of aerial survey may be solved.

## NEW ZEALAND.

The New Zealand correspondent of THE AEROPLANE writes:

### A Fatal Accident.

On Armistice Day Capt. Richard Russell, D.F.C., Croix de Guerre, while flying at New Plymouth, crashed. The machine was totally wrecked and Capt. Russell and his two passengers, one the Mayor of New Plymouth and the other a young lady, were killed.

The accident occurred at about 16.15, when Capt. Russell was descending after the final joy-ride of the day. He had made a circuit of the racecourse, which was his aerodrome while at New Plymouth, and had flown over the Boys' High School before turning to land. He was about 200 ft. up when suddenly the machine fell. Capt. Russell had switched his engine off just prior, one is told, to the accident, and was putting the nose of his 'plane down to land. From the account of an eye-witness, it would appear that when only a short distance from the earth Capt. Russell's engine went on again. The eye-witness, a lady, stated that evidently in the first tumbling Capt. Russell had lost hold of the controls, and when he regained them it was too late. This account, obviously incorrect, has been generally accepted throughout the Dominion.

The inquest was held in the evening. Mr. Vivian C. Walsh, of the New Zealand (Auckland) Flying School, stated that Capt. Russell was in his employ and had made 16 successful flights with passengers during that day and also an exhibition stunting flight. Capt. Russell had said nothing about the machine and so far as he know there was nothing wrong with it. The machine made the usual course, but when turning in to land the bank increased as if it had been struck by a gust of wind. The machine went into a spin at about 200 ft. and continued thus until it crashed. At one period it seemed as if the aeroplane would flatten out, but it failed to do so. An examination of the machine immediately after the crash showed that the controls, both rudder and elevator, were intact as far as the outside parts were concerned.

Mr. John Maxwell Warnock, the brother of the lady passenger, and a pilot of several years' experience, also gave evidence relating to the aeroplane going into a spin, but as he was not looking at the machine at the time he was unable to say what the cause of the accident was.

The finding was that the accident appeared to have been due to some unforeseen circumstance.

The machine which Capt. Russell was flying was a three-seater Avro, fitted with a 110-h.p. Le Rhône engine.

### Storage of Government Aircraft.

The Canterbury Aviation Company's aerodrome at Sockburn is being used to house the Government aircraft, and a large brick hangar is being erected for the purpose. Until the new hangar is erected the D.H.9s are housed in a tent.

Recently the number of Government machines at Sockburn has been considerably added to, and include D.H.4s (375-h.p. Rolls-Royce "Eagle"), Bristol Fighters (275-h.p. Rolls-Royce "Falcon"), D.H.9s (230-h.p. Siddeley "Puma"). The school Avros are fitted with 110-h.p. Le Rhône rotary air-cooled engines, and the company also has some 100-h.p. Monosoupape engines at the aerodrome and the old Anzanis, with which the training Caudrons were fitted.—H. B.

## SOUTH AFRICA.

### A South African Air Board.

The following Government Notice is published:—

H. GORDON WATSON,
Secretary to the Prime Minister.

Office of the Prime Minister, Pretoria.
No. 1968. October 27th, 1920.

It is hereby notied that, pending legislation which is now being drafted, the Government has appointed a Civil Air Board, constituted as follows:—

Sir William Wilson Hoy, Kt., C.B., M.Inst.T., General Manager, Railways and Harbours (Chairman);

Sir Robert Kotze, Kt., B.A., Government Mining Engineer;

Sir Henry Roland Murray Bourne, K.B.E., C.M.G., Secretary for Defence;

Henry William Stephen Twycross, Esq., Postmaster-General;

Alfred Dale Lewis, Esq., M.A., A.M.Inst.C.E., Acting Director of Irrigation;

George Owen Smith, Esq., Commissioner of Customs; with Andrew Chalmers McColm, Esq., A.M.Inst.T., as acting Secretary; to deal with such matters connected with civil aviation or aerial services as may be referred to it by the Government, and to advise upon all matters of general policy affecting civil aviation, more particularly upon the following matters:—

(a) Legislation and regulations;
(b) the development of aeronautics in South Africa;
(c) proposals for the establishment of aerial mail and passenger services within the Union and between the Union and adjoining territories;

and such other matters as may be referred by the Government to the Board.

All correspondence with regard to civil aviation or the legislation now being drafted in connection therewith should be addressed to the Acting Secretary, Civil Air Board, Room No. 99, Railway Headquarters, Johannesburg.

### Epigrams on Civil Aviation.

According to the Johannesburg *Star*, commercial flying has had a twelve months' run in South Africa unassisted by the Government and unhampered by any control other than that of financial considerations. One of these considerations has been the Customs duty on machines and parts entering the country. Another has been the high railway rates charged over the State lines.

Aviation in its adolescence is an extravagant business. The pioneers were too fresh from war to calculate nicely the

BEARDMORE

*Passenger, Postal, Goods Carriage*

*Their reliability in war is your surest guarantee of their dependability under peace conditions.*

WILLIAM
BEARDMORE
AND COMPANY, LIMITED

*Naval Construction Works,*
DALMUIR.

*Aerodrome & Hangars at Dalmuir and Inchinnan.*

AEROPLANES
S·B·A·C
THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS
WILLIAM BEARDMORE & Co. Ld. ·DALMUIR·
W B & Co

A Veldt Fire in the Transvaal seen from an Avro Biplane.

sordid risks of peace. They came from a condition where Life is cheap to a condition where Living is dear. Almost worse than financial handicaps was the apathy generally displayed towards the commercial development of flying. So the protagonists have spent their energies—and capital—on educative work; and, notoriously, education is a poorly paid profession.

That this work has gone on without accident is in no way due to Government care, for South Africa is still without air legislation despite representations made by the Aero Club who desired to see civil flying placed on a sound and safe footing.

Late in the day as it is, the Government's appointment of an Air Board is welcomed, though one misses the names of some of those who have pioneered and who have gained valuable experience if they have gained little else.

The appointment of the Postmaster-General will be viewed with satisfaction by those who think that the first future of aviation lies in the service of this great department of State.

### Liquidation of the S.A.A.T., Ltd.

The hard and valiant efforts of the South African Aerial Transports, Ltd., to pioneer flying in the Transvaal have proved abortive, and on Tuesday, Dec. 7th, the three Avro biplanes, "Natalia," "Griqua," and "Rhodesia," the hangars and equipment of the above company, were put up for sale without reserve at the Baragwanath Aerodrome.

It was intended that the whole lot should be put up for sale en bloc, but failing satisfactory offers being received for it as one lot, the various articles would be sold separately.

### A Fatal Accident.

On Christmas Day, Capt. Hemming, D.F.C., together with two lady passengers and a child, were killed at Cape Town through his machine striking a chimney belonging to a sewage farm. The machine fell and burst into flames and all efforts to quell the conflagration failed.

The late Captain Hemming has worked hard since the War to help the progress of Aviation in South Africa. He was largely instrumental in forming the Aero Club of South Africa and he has contributed much valuable information to this paper. His death is a great blow to flying in South Africa.

### Experiments in Whale Spotting.

The brothers Solomon, of Aviation, Ltd., of Cape Town, recently carried out an experiment with a D.H.6 biplane, with the object of interesting the various whaling companies in the uses of aircraft in connection with the spotting of whales.

The D.H.6 was fitted up with a third seat, and on Nov. 22nd, with Mr. T. Solomon as pilot in the front seat, Mr. Goldstone armed with a camera and a Norwegian whaling captain in the remaining two seats, flew from Langebaan, a natural aerodrome near the large whaling station at Saldana Bay, belonging to Irvin and Johnson, Ltd., of Cape Town, and carried out a three hours' flight over land and sea, covering some 170 miles out and home.

Whaling boats had been placed at intervals in case of necessity, and conversation was carried on with these with the aid of Very lights. No whales were spotted, owing, it is said, to the machine having taken a mis-directed course and not proceeding far enough out to sea.

On the following morning Mr. F. Solomon took up the machine and returned after 1¾ hours' flying, having flown 60 miles out to sea. Their object was achieved and the observer was fully satisfied that whales could easily be seen on and under the water from 1,000 feet.

### Flying in Rhodesia.

The Avro biplane "Rhodesia" belonging to the South African Aerial Transports, Ltd., which, according to the *Motor Weekly*, of Bloemfontein, has been flying in Rhodesia for four months, left Bulawayo on Sept. 8th on the first stage of its return journey to Johannesburg.

Mr. Rutherford, the pilot, made his headquarters at Bulawayo, but toured the country as far as Umtati on the east and Broken Hill on the north, visiting every township in between, and carrying hundreds of passengers. In all their flying they met with only one slight accident in N. Rhodesia.

Two trips were made to the Victoria Falls, and some splendid cinema films were obtained. While at the Falls one of Mr. Rutherford's passengers was Miss Tracy Digby, daughter of the District Engineer of the Railways, and a sequel is the announcement of the engagement of Miss Digby to Mr. Rutherford.

BUSINESS IN SOUTH AFRICA.

**An Aerial View of the Freight Depot at Johannesburg taken from an Avro Biplane piloted by Major Meller, who will be remembered as having been concerned with the large recruiting campaigns carried out by the R.F.C. in South Africa. The curious method of town-planning, common to most continents other than Europe and Asia, will be noticed in the top right-hand corner of the photograph.**

# "MESMERIC"

FIRTH'S "MESMERIC" CARBON CASE-HARDENING STEEL.

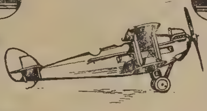
Equivalent to Air Ministry Specification S 14.

This is a thoroughly reliable case-hardening steel, easy and simple to work, certain and satisfactory in its results. It is celebrated for its tough fibrous core and extremely hard and durable case.

Firth's handbook on Aeroplane steels gives full specifications of this and other standardised qualities, including analyses and mechanical properties.

THOS. FIRTH & SONS, LTD.
SHEFFIELD.

D. H. 16



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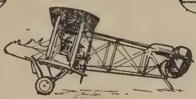

D. H. 1.

D. H. 2.

## FACTS ABOUT DE HAVILLAND AEROPLANES

During the period of August, 1914, to November, 1918, the number of DE HAVILLAND machines built in Great Britain and the United States of America amounted approximately to 30 per cent. of the total output of Aeroplanes of those two Allies.

Every DE HAVILLAND aeroplane embodies the accumulated experience of 12 years of continuous research and experimenting.

THE DE HAVILLAND AIRCRAFT CO., LTD.
STAG LANE AERODROME, EDGWARE, MIDDLESEX.

D. H. 14

D. H. 11.

D. H. 10A.

D. H. 3.

D. H. 4.

D. H. 4A.

D. H. 9R.

D. H. 9A.

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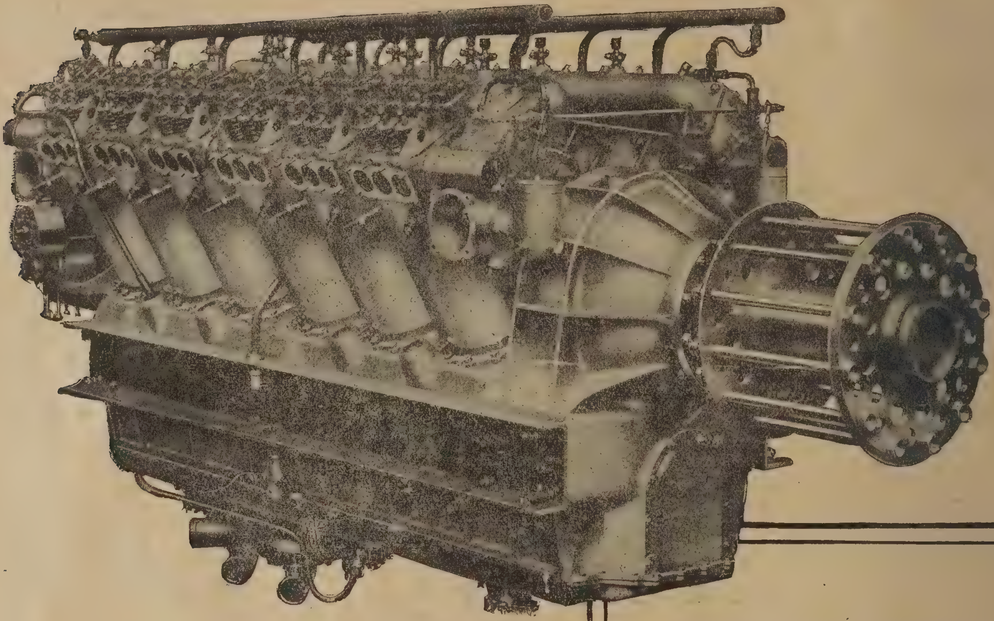
# SUNBEAM-COATALEN
## AIRCRAFT ENGINES



## "SIKH"
800 H.P. AERO ENGINE

ONLY great resources can produce great results. The "Sikh" aero engine is the outcome of unrivalled experience in manufacture and design brought to bear on the creation of a power unit of outstanding efficiency and reliability.

**The Sunbeam Motor Car Co., Limited,**
**Moorfield Works, Wolverhampton.**

*(Continued from page 6.)*

**Foreign Aeronautics.**—On May 5th Mr. C. Kenneth Murchison, M.P., read before the Inter-Parliamentary Commercial Conference in Paris a paper on "The Effect of Aerial Transport on International Commercial Relations." His arguments were received with interest and without contradiction.

On May 8th Their Majesties the King and Queen of the Belgians flew from Brussels to Farnborough in order to be present at the wedding of Lady Cynthia Curzon to Mr. Oswald Mosley, M.P. They returned by air on May 12th.

The Peace Terms with Turkey were published on May 12th.

Lieut. Ferrarin arrived at Peking on May 17th and Lieut. Masiero on May 19th.

Lieuts. Ferrarin and Masiero reached Seoul (Korea) on May 25th, Osaka on May 28th, and Tokio on May 31st, Lieut. Masiero at 13.20 and Lieut. Ferrarin at 14.20. Their total distance was 16,800 miles in about 10 weeks.

A précis of the first annual report of the Deutsche Luft-Rederei, published in this paper on May 26th, showed that 13 twin-engined and 71 single-engined aeroplanes had carried 3,000 passengers and 100 tons of goods in the year.

### JUNE.

**The Military Forces of the Crown.**—On June 3rd Maj.-Gen. Sir F. H. Sykes, G.B.E., K.C.B., C.M.G., Controller-General of Civil Aviation, was married to Miss Isabel Bonar Law.

On June 9th His Majesty the King opened the Imperial War Museum at the Crystal Palace, where the best collection of war aircraft ever seen is still on view.

**Commercial Aeronautics at Home.**—The new Avro triplane, built of standard biplane parts, and with a 160-h.p. Beardmore engine, was illustrated in this paper on June 2nd.

The first official instructions as to the use of wireless telephones on civilian aircraft were issued by the Air Ministry on June 3rd. A note on direction-finding was also issued on June 4th.

The combine between the Sunbeam and Darracq firms was recorded on June 16th.

The first photograph of the Vickers "Viking" amphibian was published on June 23rd.

On June 24th Major Trygve Gran flew from London to Skagen—the first trip in the day from England to Norway since the same pilot flew from Aberdeen across the North Sea on a Blériot in 1914.

On June 30th this paper published a complete list of all firms which at that time considered themselves as being directly in the Aircraft Industry. This list has decreased lamentably in the second six months of the year.

In the same issue appeared the Report of the Advisory Committee on Civil Aviation on the subject of subsidising air lines.

During the last week in June 118 aeroplanes crossed the Channel on the regular air lines, carrying 232 passengers, so that, including pilots, 350 people crossed by air in the week.

**Foreign Aeronautics.**—The arrangements for the training of Reserve Pilots in France was published on June 9th.

On June 3rd, at 03.38, a "Goliath" Farman, manned by MM. Bossoutrot and Bernard, started from Etampes and flew till 03.57 on June 4th, thus remaining in the air 24 hr. 19 min. and beating by 7 min. the German record made by Herr Rudolf Böhn on an Albatros in 1914. They covered 1,915 km. in the time.

M. Georges Prade, a pioneer of French aviation and a famous journalist, died on June 8th.

An important article on German Giant Aeroplanes was published on June 23rd, and disclosed much valuable technical information.

*(To be concluded.)*

## THE NEW YEAR HONOURS.

The following appears in the New Year Honours' List :—

Royal Victorian Order.

To be G.C.V.O.—His Royal Highness the Duke of York, K.G.

The King has been graciously pleased to signify His Majesty's intention of conferring a Peerage of the United Kingdom on the following :—

To be Baron.

Sir William Beardmore, Bt.

Sir William Beardmore is chairman and managing director of William Beardmore and Co., Limited, engineers and ordnance manufacturers, Parkhead Forge, Glasgow. He is also chairman of Arrol-Johnston, Limited, and is a director of Vickers, Limited, and a number of other companies. He was President of the Iron and Steel Institute in 1917. In 1902 he married Elspeth, eldest daughter of the late David Tullis, of Glencairn, Rutherglen, but has no heir.

To be Knight.

Captain Francis John Childs Ganzoni, M.P.

M.P. for Ipswich. For public services. Captain Ganzoni, F.R.G.S., was called to the Bar in 1906. He served with the British Expeditionary Force, 4th Batt. Suffolk Regt., France, 1914-18. He has travelled extensively in the British Dominions, Central and South America, and Europe. He is a member of the Lawn Tennis Council and an original member of the Royal Aero Club.

Order of the Bath.

C.B. (Civil).

Basil Edward Holloway,
Director of Finance (Materials), Air Ministry.

Air Force Cross.

A Bar to the Air Force Cross is awarded to Flying Officer Thomas Audley Langford-Sainsbury, A.F.C. (Air Force Cross gazetted Jan. 1st, 1919.)

Evidently the slump in aviation is social as well as financial, for nobody appears in the Honours' List this year as having received a title specifically for services to aviation.

---

Sir William Beardmore well deserved a peerage, quite apart from aircraft work. Since the war he has done his best to help aviation by providing a big supply of the excellent 160-h.p. engines at a low price, by having machines designed and entered for the Air Ministry Competition, and by opening an air line between Glasgow and London. The engines failed to sell, as no market exists for them as yet, though they will do well later on. The experimental machines proved to be failures, owing evidently to defective technical organisation. And the air line crashed itself and has ceased to operate. Consequently one gathers that aviation is rather at a discount at Dalmuir for the time being. Nevertheless, knowing the new Peer's belief in aviation, one hopes to see a revival of activity in his works and a revival of faith among his staff.

Mr. Ganzoni's connection with aviation seems to have been confined to being an early member of the old Aero Club. One doubts whether any members of the Royal Aero Club, as it is to-day, know him by sight.

Judging by precedent it would seem that the surest way for anybody who wants a title, and is concerned with aircraft, to get into the Honours' List is to get out of aviation.

As regards the minor Honours, in default of more explicit information it is to be assumed that Mr. Holloway gets his C.B. for helping to save the £2,000,000 in the Air Ministry which has been absorbed in the Ministry of Munitions' wangle. Or perhaps he was the genius who discovered how the Air Ministry's savings could be applied to paying the debts of the Ministry of Munitions. That would be more likely to endear anybody to Mr. Lloyd George.

Just why Mr. Langford--Sainsbury should be given a bar to his A.F.C., or why he received his first A.F.C. is "wropped in mystery." Still more of a mystery is why he alone of all the officers and men of the R.A.F. should be singled out to appear in the Honours' List.—C. G. G.

## AIR ESTIMATES FOR 1921.

One who is supposed to know stated recently that the Air Estimates for 1921-22 will amount to £19,000,000. This is less than the amount for the current year, even after deducting from the Estimates £2,000,000 which an Irishman might describe as "mis-spent savings." Still, it ought to be enough to revive Aviation, so long as the Ministry of Munitions is not allowed to work any more of its swindles on the Air Ministry.

If the R.A.F. housing problem is fairly well solved, as it ought to be by now, even granting that the Lands' Branch of the R.A.F. is the next worst thing to Dr. Addison and Co. in housing affairs, there should be plenty of money for the purchase of new and up to date machines and engines, and for the continuation of big experimental work, supposing that Air Vice-Marshal Ellington does not waste his substance on riotous turbines and futile helicopters.

And when these needs are fulfilled there should still be a goodly sum left for Civil Aviation. At any rate there should be enough to pay reasonable subsidies to a number of new air lines which are to be started this year. One can only hope that Sir Edward Ellington's department and Sir Frederick Sykes' department will both show a good deal more energy, enterprise, and intelligence than in the past.—C. G. G.

## INJUNCTION AGAINST THE AIRCRAFT DISPOSAL COMPANY.

A preliminary injunction was granted to the Wright Aeronautical Corporation against Handley Page, Ltd., and the Aircraft Disposal Co., Ltd., on December 7th, restraining them from selling or disposing of aeroplanes in the United States. The Federal Court required the Wright Co. to put up a bond of $35,000 to protect British interests if the injunction was wrongly granted, and it was said that this would be done on the following day.

Mr. F. B. Reutschler, Vice-President and General Manager of the Wright Aeronautical Corporation, said that the one thing that each American manufacturer wished to make clear was that they did not wish to stifle fair competition, but that they wanted the market freed from the sale of aeroplanes, engines and parts that are obsolete and of war-time design and construction.

# NAVAL AND MILITARY AERONAUTICS.

## The R.A.F. Ensign.

Air Ministry Press Communiqué No. 634 says:—

The design for a Royal Air Force ensign has been approved by His Majesty the King. It consists of a flag of Royal Air Force blue, one fourth of which is occupied by a Union flag as in the maritime ensigns. The fourth below the Union flag bears no device, whilst centred in the remaining half of the ensign is the Royal Air Force identification mark carried by all British Service aircraft.

The Union flag in the corner of the ensign denotes its nationality, whilst the colour and the marking serve to identify it as the ensign of the Royal Air Force. The inclusion of the Royal Air Force marking, which has become so familiar to all as the recognition mark on British Service aircraft, is appropriate in that it is the symbol under which many thousands of gallant actions have been fought in the air, and many thousands of British flying officers have been wounded or have met their death.

The ensign will be flown daily from morning parade till sunset at the Headquarters of the Force, of Areas and Independent Commands and at Royal Air Force Stations. Hoisted with due ceremony, it will be flown at the peak of a mast and gaff, at the masthead of which the distinguishing flag of the Commanding Officer will also be hoisted whenever the ensign is flown, except on those occasions when the Royal Standard or the personal Standard of a Member of the Royal Family takes the place of the distinguishing flag of the Commanding Officer, indicating that the King or a Member of the Royal Family is present.

## The Gordon Shephard Memorial Prizes.

It will be remembered that in memory of the late Brigadier-General G. S. Shephard, D.S.O., M.C., who was killed in an aeroplane accident in Flanders while commanding No. 1 Brigade, R.A.F., a sum of money was placed in trust by Sir J. J. Shephard, the father of General Shephard. The annual income from this sum is to be applied to the provision of annual prizes for essays by officers, N.C.Os., and men of the Royal Air Force.

The Air Council has decided that winners of the Gordon Shephard Memorial Prizes shall be distinguished by the insertion of the letters "G.S." before their names in the Gradation List of the Royal Air Force. Winners of the Gordon Shephard prizes for the year 1919 were as follows:—

I.—Essay on "Sea and Fleet Reconnaissance."

First prize (value £30) awarded to Squadron Leader G. H. K. Edmonds, D.S.O., O.B.E.

No second prize was awarded for this subject.

II.—Essay on "Aerial Navigation and Air Pilotage."

First prize (value £30) awarded to Flight Lieut. C. J. MacKay, M.C., D.F.C.

Second prize (value £5) to Observer Officer H. A. Jones, M.C.

An essay submitted by Squadron Leader B. E. Smythies, D.F.C., was highly commended

The following subjects have been selected for the current year's (1920) essays:—

I.—Essay in the form of a lecture on "Cross-country and Overseas Flying by a Pilot flying solo."

II.—An Investigation of the Possibilities attaching to Aerial Co-operation with Survey, Map-making and Exploring Expeditions.

Separate prizes will be given for each of the two subjects.

Essays on the foregoing subjects must reach the Air Ministry not later than May 21st, 1921.

## The Air List Affair.

In Command Paper 65, which contains the findings of the Public Accounts Committee in regard to the financial habits of the Ministries of State, there is reference made to the matter of the printing of a special Muster Roll of the R.F.C. and R.N.A.S. at the time of the amalgamation. The incident occurred during Lord Rothermere's term of service as Air Minister, and in consequence he is held to blame for permitting the printing of such a list by a private firm of map-makers without getting Treasury sanction for the expenditure.

It appears that the officer to whom the responsibility of printing such a list fell was Brigadier-General Livingston, then Deputy Master General of Personnel. He, unconvinced that the Stationery Office could do the work in quick time—there were 200,000 names in all—obtained the Secretary of State's permission to employ a private firm. No effort was made to obtain Treasury sanction.

Lord Rothermere, angry at any criticism dating back to the unfortunate time when he was Air Minister, wrote to the daily Press on Saturday, December 18, issuing an angry and undignified challenge to the Air Ministry to produce any document signed or initialled by him in reference to the case in question. On December 22nd the Rt. Hon. F. D. Acland, M.P., Chairman of the Public Accounts Committee, wrote a long letter in the *Times* dealing with Lord Rothermere's challenge. In it he demolishes that nobleman's arguments with a courtesy previously lacking in the correspondence. He points out that the White Paper contains a statement to the effect that no written record existed at the Air Ministry either as to the contract terms with private firm or of the necessary approval.

After quoting the evidence of the Accounting Officer of the Ministry, that of the officer directly concerned (Brig.-Gen. Livingston) is abstracted as follows:—

"3. From the evidence of the officer concerned (who was abroad during the summer), on November 3rd.

> Time was very important, I admit, but we were told we could not get it at all, and the matter was referred to the Secretary of State. The whole question arose at a meeting at the Air Ministry. . . .
>
> I went to the firm and asked if they could undertake this work, and they said they could, and I came back and informed the Secretary of State that I found it could be done, and we got permission to place the order.
>
> I maintain that I did not actually make the arrangement, but I found the firm prepared to do it, and came back to the Air Ministry and said they could do it.
>
> *Question.*—And obtained a decision from the Secretary of State for Air that they should do it?
>
> *Answer.*—Not specifically that firm, but that it should be printed outside.

"The last answer clears up a point made by Lord Rothermere, and I am glad to explain that he does not appear to have been personally responsible for the actual selection of the particular firm. Perhaps if he had gone into the matter carefully with the Deputy Master-General of Personnel, he might have realised that the firm selected by the latter, which was primarily a lithographic firm, would not be likely to do the work satisfactorily."

This one would think was a sufficiently definite reply to Lord Rothermere, whose period of office as Air Minister will do little to bring fame to his name. Those who have memories of the chaos produced in that department by the noble lord in his efforts to instil "business methods," will agree that silence is for him the best defence.

He has, however, replied to Mr. Acland on December 23rd in the *Times* news-sheet, misreading that gentleman's statements with a skill which accounts in some degree for his silence in the House of Lords. The letter ends with a protest at the failure of the Committee to hear his views in person. No object can be served by a reproduction of the letter.

The affair may seem insignificant, but great principles are affected. Other Ministers have been censured for permitting unauthorised expenditure, but they are as a rule keenly observant of the tradition which makes each Minister accept willingly all responsibility for that which happens in his department.

## Leicester v. R.A.F. (Rugby Team).

On Dec. 28th, at Leicester, the R.A.F. were beaten by Leicester by 5 goals and 1 try (28 points) to 2 goals and 2 tries (16 points). From the beginning of the game Leicester forced the pace, and although the R.A.F. put in some very pretty saving, the rushes and back play of the home team took a lot of stopping. Bryson scored the first try for the R.A.F., Hicks converting, and just before the interval Thomas added a second try, which was not converted. At half time Leicester led by 23 points to 8.

The second half was marred by a thunderstorm with torrents of rain which made the ball extremely difficult to handle. Mylne scored the third try, which was converted by Hicks. The final play was confined to a series of forward rushes and ended with the score as mentioned above. The R.A.F. team was as follows:—G. Pennington; S. Ridge, C. Bryson, W. Rogers, G. Thomas; W. Jones, A. Mylene; T. Elmhurst, W. W. Wakefield, R. Usher, L. Whitworth, E. Turner, W. Hicks, A. Drabble, and T. Smith.

## No. 2 A.D., R.A.F., B.E.F.'s Reunion.

An officers' reunion of No. 2 A.D., R.A.F., B.E.F., will be held in London on Friday, Feb. 4th, Major C. C. Smith will preside. Will those interested please send their names and addresses to Mr. J. D. Fairbairn, "Hillsboro," Cromwell Avenue, Bromley, Kent, or to Mr. F. Malcolm Burr, 2, Finsbury Square, E.C.2.

## "A" Naval and 216 Sqn. Dinner.

A dinner has been arranged for officers and men of the above squadron for April 2nd, 1921. Will those interested communicate with E. D. Harding, 5, Belsize Square, N.W.

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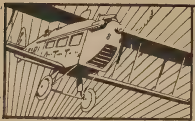


# COMMERCIAL AERONAUTICS AND CIVIL AERIAL TRANSPORT.

## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### OFFICIAL NOTICES.

AIR MINISTRY: NOTICES TO AIRMEN.

No. 140, Dec. 29th, 1920.—Air Navigation Directions Amendments: Authorised patterns of log books to be used. (359696/20.) Further directions as to use of log books.

No. 141 of Dec. 31st, 1920.—Fixed Balloon at White City, London. Gives position of this and states that it will be flown from Dec. 24th, 1920, to Jan. 51th, 1921.

### CONTINENTAL ARRIVALS AND DEPARTURES.

[*The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M): next the number of passengers: and finally the name of the pilot and number of mechanics, if any.*]

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G. E. A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

**DECEMBER 27th:**
NIL.

**DECEMBER 28th:**
M.A., Spad, F-CMAV, Paris-London, 12.30-15.20, M., 2, Le Sec.
M.A., Breguet, F-CMAG, Paris-London, 13.05-13.06, 30/12/20, G., 1, Martel

**DECEMBER 29th:**
NIL.

**DECEMBER 30th:**
M.A., Breguet, F-CMAI, London-Paris, 12.47-15.25, G., Nil, Challoux.
M.A., Breguet, F-CMAC, London-Paris, 13.45—, G., Nil, Charpentier.
M.A., Breguet, F-CMAH, London-Paris, 13.46—, G.&M., Nil, Le Men.

**DECEMBER 31st:**
NIL.

**JANUARY 1st:**
NIL.

**JANUARY 2nd:**
NIL.

### The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

**DECEMBER 27th:**
NIL.

**DECEMBER 28th:**
NIL.

**DECEMBER 29th:**
NIL.

**DECEMBER 30th:**
H.P.T., HP, G-EATN, London-Paris, 12.15-15.46, G., 5, ——
H.P.T., HP, G-EATK, Paris-London, 12.43, landed Lympne 16.31, G.&M., 2, ——
S.N.E.T.A., DH9, O-BEAU, Brussels-London, 12.00, landed St. Inglevert, G &M., Nil, ——

**DECEMBER 31st:**
NIL.

**JANUARY 1st:**
NIL.

**JANUARY 2nd:**
NIL.

### Air Port Statistics.

CONTINENTAL

| | | | | | |
|---|---|---|---|---|---|
| MACHINES: | | | | | |
| Croydon | 5 | Cricklewood | 3 | Total | 8 |
| PERSONNEL.—Passengers: | | | | | |
| Croydon | 3 | Cricklewood | 7 | Total | 10 |
| Crews: | | | | | |
| Croydon | 5 | Cricklewood | 5 | Total | 10 |
| | | | | Total Personnel | 20 |

### Inland Flying at Croydon.

Dec. 27-Dec. 13st.—Nil.

Jan. 1st.—L.A.S., DH6 from Leatherhead and joy-riding (Muir); I.A.L. "Vimy," 1 test (Barnard).

Jan. 2nd.—L.A.S. DH6, joy-riding (Muir); I.A.L. "Vimy," joy-riding (Barnard).

### The London Terminal Aerodrome.

It is regretted that the dinner and smoking concert arranged for January 7th has been postponed owing to the closing down of A.T. and T. and the Air Post of Banks, and the consequent diminution in numbers of the personnel at the Aerodrome.

It is noted that Trust Houses, Ltd., have now installed a stove in the first-class lounge. The desirability of this was pointed out in these notes some time ago.

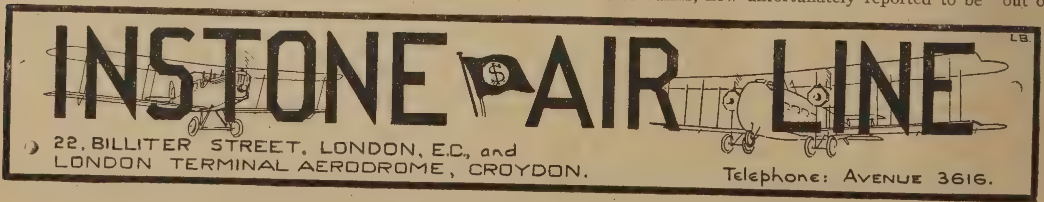
Saturday was a bad day owing to rain In the morning Mr. Muir arrived on the Leatherhead D.H.6 and took up several passengers, returning again in the evening. In the afternoon it was pouring with rain, nevertheless Mr. Barnard brought out the "Vimy" and made a short test flight. There were low-lying clouds, but otherwise visibility was quite good. Epsom Grand Stand could be seen easily.

On Sunday the same two machines were out, Mr. Muir carrying about 40 passengers.

On the Wednesday before Christmas, Mr. Barnard came from Paris to Croydon with the following load: a quarter to half a ton of mince pies (one hopes that everyone has recovered from Christmas sufficiently to be able to imagine these with safety), a 7-9 h.p. Indian motor-cycle and side-car, Mr. Chattaway, a mechanic, and two passengers, and the remainder of the space stacked full with parcels. They nearly had to land at Lympne owing to weather, but when they realised that if they did this they would have to unload the whole machine before they could get at their suit cases, they decided to chance the weather and carry on to Croydon, which port they successfully made.

On Monday of this week the "Vimy" was off to Paris with two paralysed officers and their attendants. One, Mr. Howard, had to lie on the floor, a bed of pillows being made; the other, Mr. Bibby, was able to sit up. It is understood that the machine was put at their disposal by the directors of the I.A.L. The officers are bound for the Riviera, and may go the whole way by air, as this method of travel is far better and more comfortable than by existing ground methods.

All of Mr. Keep arrived from Yeovil in one Westland limousine during the morning, though one was told that it would be necessary to use two machines to take him back. The second machine which he (or a pilot he brought with him) is taking back, is one of the two which were used by the late Air Post of Banks, now unfortunately reported to be "out of



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Telephone: AVENUE 3616.

Mr. Chapman, his D.H.6, and his Family, at Leatherhead.

formation," Mr. Kennedy being in the Bankruptcy Court. Mr. Keep will call for the other machine in due course.

Mr. Keep is shortly bringing a new Napier Westland to Croydon. This has been bought by the Air Ministry according to the contract that they would buy one of each type which won the Air Ministry competitions. In fact, altogether Croydon seems to be awakening from its winter sleep already.

G. D.

### Brooklands.

One is informed that it is the Aircraft Disposal Company who are removing aeroplanes from Brooklands. Large numbers of Avros, Armstrong-Whitworth F.K.8s, and lately Sopwith "Dolphins" have been removed on motor-lorries from the hangars occupied formerly by the R.A.F., so that very few of these machines now remain at Brooklands.

Mr. H. G. Hawker, at the time of writing, was expected to arrive at the aerodrome in order to test some Sopwith "Doves," which will be flown later to Sweden and delivered to an aviation firm in which Mr. Hawker is interested.—J. F. S.

### Reading.

Mr. Muir, of the Leatherhead Aviation Services, was at Reading from December 27th-30th, together with another joy-riding concern. He flew the Avro, and took up several passengers for extended flights, having one forced landing in Windsor Park. The Leatherhead Aviation Services are to be congratulated on the amount of work they are doing, and also in seemingly choosing the right place in which to carry this out.—G. D.

### Newspapers by Air.

It is reported that a scheme is being discussed whereby certain London daily papers are proposing, in the early spring, to send papers by air so as to enable them to be sold on the Paris streets by 8 a.m.

This obviously will not be accomplished until all arrangements for night-flying are completed on the London-Paris route.

### The Winner of the Aerial Derby.

Mr. Frank T. Courtney, who won the Aerial Derby this year on the Martinsyde "Semiquaver," has been up North lately in connection with tests of the "Alula" wing. No details are to hand except that the success of the wing may be gauged from the fact that Mr. Courtney says it will soon have to be re-named the "Alleluiah."

It is understood that Mr. Courtney has also been testing some new machines designed and constructed by Boulton and Paul, Ltd., of Norwich.

## FOREIGN INTELLIGENCE.

### FRANCE.

### Honours in French Aviation.

In the *Journal Officiel* for Dec. 2nd the following promotions and nominations to the various grades of the Legion d'Honneur are announced:—

Grade d'Officier.—M. Louis Breguet, director of the Societé des Ateliers d'Aviation Breguet; M. Alfred Leblanc, president of the Chambre Syndicale des Industries Aeronautiques; M. Rudolphe Soreau, Vice-President of the Aéro Club de France.

Grade de Chevalier.—M. André Herbemont, Technical Director of Blériot Aeronautique, M. Marcel Vuillerme, Chief Engineer of Etablissements Breguet; M. Louis Capazza, Vice-President of the S.F.N.Ae.; M. E.-M.-J. Montgermon, Director-General of the Etablissements Voisin; M. E.-M.-G. Lepère, Engineer of the S.T.Ae., designer of the American Lepère fighter; M. Eugène Serre, Director-General of the Maison Farman; Dr. Garsaux, Chief of Aeronautical Medical Service; M.M. de Lafreté and Jacques Mortane, whose outspoken articles on aeronautics are well known in France; and M. E. Bossoutrot, pilot of the Farman firm.

### The Michelin Cup.

Regulations for the Michelin Cup Competition for 1921 have just been issued by the French Aero Club. The course is one of 1,860 miles, with 14 landings, and the competitor covering it in the highest speed practicable for commercial aviation before January 1st, 1922, will be declared the winner. The cup will not be competed for after this year.

### Theft from Saint Cyr Aerodrome.

Since September last a considerable amount of pilfering has been known to have been carried out from Saint Cyr Aerodrome, and accessories, such as magnetos, spare wheels, leather flying gear and even lorries, aeroplane trailers, and automobiles have been disappearing, until it now transpires that material to the value of 1,000,000 francs has been taken.

The fact that all carefully laid traps had been skilfully avoided suggested that the thieves must have been connected in some way or other to the camp. It is now reported, however, that the authorities have arrested 37 persons, most of them soldiers, including a captain, a lieutenant, and a sergeant who was acting as secretary to the Commandant, and also some civilian receivers who are small dealers in the various suburbs of Paris.

### UNITED STATES OF AMERICA.

### Echoes of the Pulitzer Trophy.

From the standpoint of the newly-formed Aero Club of America, the Pultizer Trophy, held at Mitchel Field, Mineola, L.I., on Thanksgiving Day, Nov. 25th, was a huge success, between 35,000 and 40,000 people having journeyed out to Long Island to witness the event. There were no serious accidents, although on the same day in an automobile race held at Los Angeles, Cal., three men were killed, including Chevrolet, the famous driver.

Lieut. C. C. Moseley, the winner, on the Verville V.C.P. Racer, had trouble with his engine, inasmuch as he was unable to give his engine full throttle without it missed badly, consequently he could not run at more than 1,650-1,700 revs. per min. Captain (formerly Lieut.-Col.) H. E. Hartney, on the standard Thomas Morse M.B.3, with half the engine power of the winner, did extraordinarily well for a machine designed to do but 150 m.p.h. In spite of oil and water boiling over, he steered a splendid course and made very good turns at the pylons. In spite of the boiling trouble, being an overseas' pilot with many victories to his credit, both while with the R.F.C. and the American Air Service, he was able to finish second only 9 miles slower than the winner's 178 m.p.h.

After the race on Nov. 27th, Lieut. C. C. Moseley, at Mineola, brought the American speed record up to 186 m.p.h. in a series of flights over the measured kilometre. Trouble was again experienced with the engine, as on the ground 1,950 r.p.m. was reached, but on getting into the air the engine speed rapidly fell until it was 200 revs. a minute below the ground speed. Immediately after the tests the machine was shipped to McCook Field in order to enable the carburettor to be tested in the experimental wind tunnel.

Capt. H. E. Hartney, on the Thomas-Morse M.B.3, also flew over the measured kilometre and succeeded in logging 171.25 m.p.h. with an average for six flights of 170.25 m.p.h.

## THE ROYAL AERO CLUB.

### Meeting of the Racing Committee and the Representatives of the Society of British Aircraft Constructors.

A meeting of the Racing Committee and the representatives of the Society of British Aircraft Constructors was held on Monday, Nov 29th, 1920, when there were present:—

Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the chair; Major-Gen. Sir Sefton Brancker, K.C.B.; Col. F. Lindsay Lloyd, C.M.G., C.B.E.; Group-Capt. C. R. Samson, C.M.G., D.S.O., R.A.F.

From the Society of British Aircraft Constructors:—

Capt. P. D. Acland; Commander James Bird; Capt. G. de Havilland; Major Vincent Nicholl, D.S.O., D.S.C.; Mr. C. K. C. Patrick; Mr. L. L. Walker.

Harold E. Perrin, secretary.

*Schneider Race, 1921, for Seaplanes.*—Recommendations were suggested to be put forward by the Club at the Bureau of the Federation Aeronautique Internationale at its meeting to be held in Paris on Jan. 10th, 1921.

*International Speed Race for Flying Machines.*—Certain recommendations were suggested to be put forward in the event of the Federation Aeronautique Internationale deciding to hold an International Speed Race to replace the Gordon Bennett Race.

### Committee Meeting.

A meeting of the Committee was held on Wednesday, Dec. 15th, 1920, when there were present:—Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the chair; Major-Gen. Sir Sefton Brancker, K.C.B.; Mr. Ernest C. Bucknall; Mr. G. B. Cockburn; Lieut.-Col. F. K. McClean; Lieut.-Col. Alec Ogilvie; Lieut.-Col. Mervyn O'Gorman, C.B.; Group-Capt. C R. Samson, C.M.G., D.S.O., R.A.F.; and the Secretary.

*Joint Standing Committee of Royal Aero Club and Society of British Aircraft Constructors.*—Report of meeting of the Joint Standing Committee of the Royal Aero Club and Society of British Aircraft Constructors held on Nov. 25th, 1920, was received and adopted.

The views of the Joint Standing Committee on proposed races in Great Britain in 1921 were referred to the Racing Committee.

*Flying Services Fund.*—Report of the meeting of the Flying Services Fund Committee held on Nov. 26th, 1920, was received and adopted.

*Racing Committee.*—Report of meeting of the Racing Committee with representatives of the Society of British Aircraft Constructors held on Nov. 29th, 1920, was received, and the recommendations in regard to the regulations for the Jacques Schneider Cup, 1921, and the proposed International Speed Race to take the place of the Gordon Bennett Aviation Cup were adopted for submission to the Bureau of the Federation Aeroanutique Internationale on Jan. 10th, 1921.

*House Committee.*—Report of meetings of the House Committee held on Dec. 6th and 13th, 1920, respectively, were received and adopted.

*Election of Members.*—The following new members were elected:—Hubert Adolphus Jordan; Capt. Frederick Kynaston Wells (late R.A.F.).

*Re-election of Members in Accordance with Rule 41.*—On the recommendation of the House Committee, the members elected for the year 1920 were re-elected in accordance with Rule 41.

*Federation Aeronautique Internationale.*—The following delegates were appointed to represent the Club at the meeting of the Bureau of the Federation Aeronautique Internationale to be held in Paris on Jan. 10th, 1921:—Lieut.-Col. Mervyn O'Gorman, C.B.; Major R. H. Mayo; and Mr. H. E. Perrin, secretary.

The items for discussion include: Schneider Race, 1921, for Seaplanes; Gordon Bennett Balloon Race; International Speed Race; Special Brevet (aerobatics) proposed by the Royal Aero Club; Aerial Derby Around the World.

*Aero Club of South Africa.*—The affiliation of the Aero Club of South Africa was approved and agreement signed.

*British East Africa.*—The Royal East African Automobile Association at Nairobi were appointed the Club's official representatives in British East Africa.

*International Aviation Insurance.*—The report of Major E. H. Tindal Atkinson, the Club's representative on the Law Committee of the Federation Aeronautique Internationale, on the question of international aviation insurance was received and adopted. The Secretary was instructed to forward the same to the Federation Aeronautique Internationale.

*Aviators' Certificates.*—The following aviators' certificates were granted:—7906, Harry Redman Coningsby; 7907, Harold Snow Davie; 7908, Christopher Oswald Towler.

## PERSONAL NOTICES.

**[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another. The Editor will also be glad to publish free of charge applications for work from demobilised officers and men who have found difficulty in obtaining employment. It is hoped that none who are not in urgent need of work will avail themselves of this offer.]**

### Deaths.

ESSELL.—Flying Officer Robert Narcissus Essell, R.A.F., who was accidentally killed on Dec. 9th while on active service in Mesopotamia, was the second son of Col. F. K. Essell, C.M.G., and Mrs. Essell, Beveré Knoll, near Worcester. He was 21 years of age.

HOPE.—Major Linton Hope, R.A.F., M.I.N.A., F.R.Ae.S., died at Kingshott, Fernhurst, Haslemere, Surrey, on Dec. 20th. He was 57 years of age.

Major Linton Hope was famous as a yacht and motor-boat designer long before the War. His great knowledge of wood construction was of high value to the Air Board, and later to the Air Ministry. After the War he joined the technical staff of the Fairey Aviation Co., Ltd., and has produced some very interesting design work.

LEETHAM.—Horace Arthur Harbord Leetham (late Capt., R.A.F.), of the Galaha Co., Colombo, died on Oct. 15th at the General Hospital, Colombo, of enteric fever. He was 22 years of age.

McDONALD.—Flying Officer Ian Donald Roy McDonald, M.C., D.F.C., R.A.F., late Captain and Flight Cmdr 24th Squadron in Flanders, and France, was killed on Sept. 22nd fighting in Mesopotamia. He was the only son of the Honourable Donald McDonald and Mrs. McDonald, of The Bungalow, Antigua, B.W.I., and was 22 years of age.

### Engagements.

CHALMERS—VOULES.—The engagement is announced of Flight. Lt. Colin Ward Sylvester Chalmers, R.A.F., younger son of Mr. and Mrs. J. H. Chalmers, 4, Cavendish Place, Bath, to Audrey Kate Mervyn, elder daughter of Mr. and Mrs. Mervyn F. Voules, Cordwalles, Camberley.

McCALMAN—HUGONIN.—A marriage has been arranged, and will take place very shortly, between the Rev. Hugh McCalman, M.C., R.A.F., only son of Lieut.-Col. and Mrs. McCalman, of 3, Upper East Hayes, Bath, and Majorie Ruth, elder daughter of Edgar Hugonin, formerly of Bramley, Surrey.

### Marriages.

BARRINGTON—WOOD.—On Dec. 28th, in London, Francis Edward Philip Barrington, Flt. Lieut., R.A.F., only son of the late P. Sidney Barrington, of Cheeverstown, Clondalkin, Co. Dublin, and of Mrs. A. R. Hyde, of Streatham, to Ethel Rose (Foxie), second daughter of the late W. J. Wood, and of Mrs. Wood, of Fulham.

ELLIOTT—BAKER.—On Dec. 28th, at St. George's, Hanover Square, W., by the Rev. J. R. Powell, M.A., Flt. Lieut. Robert A. G. Elliott, R.A.F.M.S., eldest son of the late George Elliott, J.P., and Mrs. Elliott, of Arvagh, Cavan, to Georgina, second daughter of the late Thomas Edward Baker, and the late Mrs. Baker, late of Maythorne, Tenbury Wells, and niece of Charles G. Partridge, J.P., of Lambswick.

ELLWOOD—MATTHEWS.—On Dec. 11th, at Bombay, Aubrey Beauclerk Ellwood, D S.C., R.A.F., youngest son of the Rev. C. E. and Mrs. Ellwood, Cottesmore Rectory, Oakham, was married to Lesley Mary Joan, elder daughter of Mr. and Mrs. W. P. Matthews, The Old House, Walmer, Kent.

HOBBS—RAZGA.—On Dec. 3rd, at Marlborough House Chapel, F. Dudley Hobbs (late 2nd Life Guards and R.A.F.), of Norbury Hall, Norbury, S.W., was married to Else Razga, of Copenhagen.

RALPH—HEWETSON.—On Dec. 7th, at St. James' Church, Piccadilly, Charles John Ralph, late R.A.F., was married to Irene, youngest daughter of Mr. and Mrs. William M. Hewetson, of Dudley House, Sutton, Surrey, by the Rev. N. W. Lydekker.

WEBSTER—ARATHOON.—On Dec. 24th, at St. Peter's Church, Caversham, Harold Leslie Webster, late Capt. R.A.F., eldest son of Mr. and Mrs. R. A. Webster, of Montreal, Canada, was married to Rosalie (Rosebud), eldest daughter of Mr. and Mrs. T. Arathoon (late of Calcutta, India), of Caversham Court, Caversham, Oxon.

WIGHT—BELL.—On Nov. 20th, at Port of Spain, Trinidad, West Indies, Gerald R. Wight, late Lieut. 111 Squadron, R.A.F., was married to Margaret, only daughter of the Hon. A. G. Bell, C.M.G., and Mrs. Bell, of Portaferry, Ireland.

### Births.

BENNETT.—On Dec. 13th, at Northdene, King Edward Avenue, Broadstairs, the wife of Mr. Vyvian G. A. Bennett, R.A.F., of a son.

BROWN.—On Dec. 13th, to Constance Mary and Sqdn. Ldr. Vernon Brown, R.A.F., of 60a, Prince of Wales Road, S.W.11—a daughter.

HAY-CURRIE.—On Sunday, Dec. 12th, the wife of Capt. Phillip Maynard Hay-Currie, late R.A.F., of The Phrylls, Langford Lake, Vancouver, B.C., of a son, wee "Peter," who lived 17 hours only.

LLOYD.—On Dec. 15th, at Kasauli, India, the wife (*née* Kathleen Meadows) of Lieut. H. Pughe Lloyd, M.C., R.A.F.—a daughter.

SEELY.—On Dec. 16th, at 11, Smith Square, Westminster, to Major-General and the Hon. Mrs. J. B. Seely, a son.

STEWART.—On Dec. 8th, the wife of Capt. Harry Stewart, of a son. (By cable) 202 Squadron, R.A.F., Alexandria.

WALDRON.—On Dec. 23rd, at a nursing home, Southsea, to Ivy Hilda (nee Allen), the wife of Flight-Lieut. E. N. E. Waldron, R.A.F. —a son (Alan Noel Edwin).

## BANKRUPTCY.

C. J. MACKENZIE-KENNEDY, 102, Cromwell Road, S.W., Receiving order Dec. 18th. Meeting of creditors Dec. 31st, 1920.

[Mr. Kennedy will be remembered as the builder of the four-engined giant aeroplane on Sikorski lines which was built at Northolt early in the War. Later he shared with Mr. Humphrey, since adjudicated bankrupt, in the building of another large aeroplane by Dawsons, of Newcastle-on-Tyne. This machine was never finished. During 1920 he formed the Air Post of Banks, which operated for some weeks with an excellent staff of pilots. This firm ceased operations in December, 1920.]

## MR. FORD'S FRAUDS.

On Nov. 16th Archibald Burch Ford (late R.A.F.) was charged with obtaining £4 by false pretences and food and lodging to the value of £8 from Mrs. Whittaker, of the Crown Hotel, Harrogate, and tendering a worthless cheque to a Ripon bank. He was sentenced to three months' imprisonment in the second division.

On Dec. 28th, at Westminster, he was further charged with stealing, in September, a motor-car worth £550.

Mr. J. D. Cassels, for Ford, appealing, said that he pleaded guilty, and had confessed to 12 charges against him in various parts of the country, so that all his misdeeds might be taken into account. Mr. Cassels said that Ford was the son of a retired barrister. In 1913, when he was 19, he went to France and learned to fly. He served in the R.F.C. in the early part of the war.

Sentence of nine months' imprisonment was passed.

It is alleged that Ford is the man who recently escaped arrest by stealing an aeroplane at Pau and flying to Spain. Previous to that he had taken a D.H.6 to Switzerland, crashed it, and had lived at three different Swiss hotels in succession by hypothecating to each his wrecked aeroplane. It is understood that the hotel proprietors have since been litigating each other as to its ownership.

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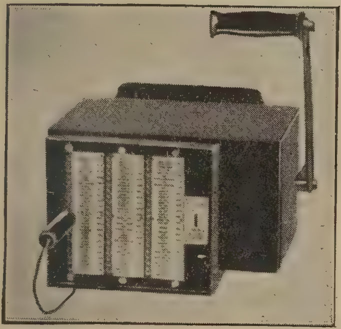

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## INDEX TO ADVERTISERS

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Arrol-Johnston, Ltd. ... ... ... *Front Cover*
Auster, Ltd. ... ... ... ... ... *Front Cover*
Automatic Telegraph Co.... ... ... ... 27
Beardmore Aero Engines, Ltd., The *Front Cover*
Beardmore, William, & Co., Ltd. ... ... 17
Bowden Brake Co., Ltd., The ... ... ... 28
Boulton & Paul, Ltd. ... ... ... ... 15
Bray, Gibb & Co., Ltd. ... ... ... .. 27
Bristol Aeroplane Co., Ltd. ... ... ... 8
Coan, R. W. ... ... ... ...*Inside Front Cover*
Cunard Line ... ... ... ... ... ... 26
De Havilland Aircraft Co., Ltd., The... ... 19
Fairey Aviation Co., Ltd., The ... ... ... 7
Firth, Thos., & Sons, Ltd. ... ... ... 19
Grahame-White Co., Ltd. ... ... ... 28
Hancock, James Lyne, Ltd. ... ... ... 28
Handley Page, Ltd. ... ... ... ... 1
Imray, Laurie, Norie & Wilson, Ltd.... ... 28
Instone Air Line ... ... ... ... ... 24
Metal Airscrew Co., Ltd.... ... ...*Front Cover*
Naylor Brothers, Ltd. ... ... ... ... 27
New Pegamoid, Ltd. ... ... ... ... 28
Nieuport and General Aircraft Co., Ltd. ... 1
Roe, A. V., & Co., Ltd. ... ... ... ... 2
Rolls-Royce, Ltd. ... ... ... ... ... 11
Rubery, Owen & Co. ... ...*Inside Back Cover*
Sagar, J., & Co., Ltd. ... ...*Inside Back Cover*
Sankey, J. H , & Son, Ltd. ... ... *Back Cover*
Sunbeam Motor Car Co., Ltd. ... ... ... 20
Supermarine Aviation Works, Ltd. ... *Back Cover*
Titanine, Ltd. ... ... ... *Front Cover & 23*
Vickers, Ltd.... ... ... ... ... ... 13

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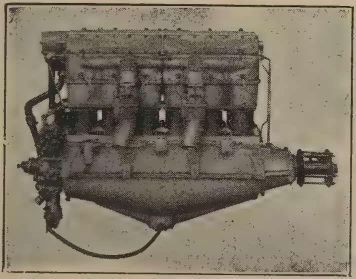

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# THE AEROPLANE

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One does not suggest that our Department of Civil Aviation is perfect, but one can claim certainly that it knows more about its job than does any similar Department elsewhere. The officials of the Department are all personally enthusiastic about the possibilities of commercial flying. They all have long experience of practical aviation. And, above all, they are transparently honest in *all* their dealings, while at the same time quite clever enough to know when anybody is not being honest with them.

### Foreign Trade.

The multifarious activities of the Aircraft Disposal Co. have gained a footing for British aircraft in many countries where foreign aircraft would have had the trade to themselves if that much-abused firm had not done what it has done. It is for the makers of the various aeroplanes, engines, and other material which are being sold by that firm to step in behind it and make the best of the free advertisement which has been gained for their products.

Very shortly THE AEROPLANE hopes to afford British manufacturers an opportunity of following up the pioneer work which has thus been done abroad. A series of special foreign issues, each printed in the language of the country to which it is being sent, will be circulated with official assistance in those countries where there is the best prospect of selling British goods. Certain countries whose Governments are keen on developing internal communication by aircraft have promised very generous support to the scheme, and it is to be hoped that British manufacturers will have the intelligence to seize the opportunity thus offered.

### Our Excellent Products.

Despite the outcry of ill-informed correspondents of daily newspapers, it is now true that British aero-engines, such as the Napier, Rolls-Royce, Siddeley, and Beardmore, excel in economy and reliability the best foreign engines, whether those of our late Allies or of our recent enemies. One proof is that the famous Herr Fokker is fitting Siddeley "Pumas" to his latest commercial monoplanes. Also, our engines which are still in the experimental or test stage, such as the Napier "Cub," the Rolls "Condor," the Bristol "Jupiter," the Siddeley radials, and the various versions of the A.B.C. as modified by the Royal Aircraft Establishment, give promise of maintaining our lead in this phase of aircraft work.

In the improvement of aeroplanes themselves we are still well ahead. No other country has anything which gives such promise of a revolution in aeroplane efficiency as does the Handley Page wing and the Alula wing. Germany alone shows a proper appreciation of general arrangement design for commercial purposes, and with designers such as Capt. de Havilland, Capt. Barnwell, Mr. Fairey, Mr. Pierson, Mr. Bruce, Mr. Short, Mr. Handasyde, Mr. Handley Page, Mr. North, Mr. Scott Paine, Mr. Chadwick, and Mr. Folland always available we need not fear German competition so long as our commercial men will find money for new designs.

### Air Transport Affairs.

It is true that the shutting down of Aircraft Transport and Travel, Ltd., and the curtailing of the Handley Page services to the Continent have brought our air transport to a very low ebb, while the subsidised French services continue in full blast. But, after all, we have the experience which others have not.

Whether the present apparent *rapprochement* between the chiefs of the moribund A.T. and T., Ltd., and the chiefs of the very live Handley Page Transport, Ltd., indicates a possible alliance or merely a hidden war between H.P. Transport, Ltd., and the well-known Daimler Hire Company, one does not profess to understand. But one is very certain that personalities of the calibre of Mr. Handley Page and Mr. Frank Searle, whether in alliance or in competition, will certainly make civil aviation move vigorously as soon as trade revives and money is available for fresh developments. Anyhow, competition is always good for trade.

It is a pity that the pioneer work done by A.T. and T., Ltd., has come to nought. But that work has not been wasted. The men who gained their experience with A.T. and T., Ltd., are available as pilots, mechanics, traffic managers, and so forth for any firm which has the pluck to put up the money for a new air line. They have learned that best of all lessons, how things ought *not* to be done.

In this affair there is the great consolation that whatever money has been lost in the experiment has come out of the pockets of the Motor Trade rather than the Aircraft Industry. It may be regarded as a small instalment of the many millions of pounds which motor-mongers in general owe to aircraft people on account of the many more millions which they made from aircraft designs which had been produced by the Aircraft Industry and handed over without fee or royalty to be reproduced more or less well by the motor-mongers at the behest of the Aircraft Production Department of the Ministry of Munitions.

### New Blood.

One's personal view is that motor-mongers in general, with a few exceptions, are far too permanently broke—being about the worst business men in the world—to be of any further use to the Aircraft Industry, and that when the trade of the world revives the people who will find the money for air lines will be the big shipping firms, who will run them as branch establishments, or the banks, who will finance air lines *ad hoc*. At any rate, one is certain that the less the Aircraft Industry has to do with the motor-mongering fraternity the better.

To be successful the Aircraft Industry must think internationally. Our air lines must run abroad and our machines must be sold abroad. The Motor Trade, with a few honourable exceptions, has never had an outlook beyond the parish pump, and consequently America and Germany captured the World's automobile trade before the war. It is only our shipping firms and our banks who are used to thinking internationally, and it is to them that the Aircraft Industry must appeal when the present slump is allowed to pass.

Money for development work is very strictly rationed today, but it is to be had by those who know how and where to get it. In a few months' time the rations will be increased, and then we may look for fresh developments.

During the past year the Aircraft Industry has had many disappointments. Sporting flying has been a failure, although the Aerial Derby and the R.A.F. Tournament proved that the Public will flock to see flying when they know it will be good. Air Transport, after promising great things, has dwindled dismally. Both these failures have been due partly to bad management and partly to lack of money. Nevertheless, we have had valuable experience, and it is only by mistakes that we acquire the experience which leads to success.

Therefore one is convinced that as soon as the International Financiers let loose the money for fresh developments—that is to say, as soon as the weaklings have been shaken out of the business community—we shall see a very great revival in Air Transport. It is earnestly to be hoped that this development may be one of the first phenomena of a Happy New Year.

### Lines of Development.

When, as indicated, the present artificial shortage of money ceases, and the International Financiers release capital for development work, there is every prospect of a huge increase in passenger traffic on our air lines. Certainly there is no fear of this traffic being decreased by the few accidents which have happened during the past year. On the contrary: for people seem now to realise how very few accidents have occurred.

One cause of one's confidence in this prospective increase is the fact that for some curious reasons vast numbers of Americans have decided to come to Europe this year. A friend who is very much in the know in such matters states definitely that never before have the advance bookings to England on the trans-Atlantic steamships been so heavy as they are to-day. Whether the coming Americans are holiday makers or business people is not clear. The point is that they are prospective passengers.

At the moment America holds the bulk of the World's gold supplies, acquired during the three years in which the United States were supplying munitions of war to all the Allies, being so "darned neutral" that they did not care which nation beat Germany. Consequently, as one humourist put it, "everybody in America is suffering from sciatica caused by sitting on cold gold."

That being so, America wants to warm that gold by using it and wants to buy something in Europe in exchange for it. That is probably why so many Americans are coming to England in the Spring. And that is when the impoverished Aircraft Industry may, if it be clever, re-acquire some of the wealth which it helped to hand over to the States during the war. It is to be hoped that our lines will be properly financed and put into full working order by the time the American invasion begins.

*(To be continued.)*

## SUBSIDIES (OF SORTS) FOR AIR LINES.

Air Ministry Communiqué No. 635, issued on Jan 8th, 1921, reads as follows:—

The Air Ministry announces that the Cabinet has approved, subject to Parliamentary sanction, the grant of a sum for the direct assistance of Civil Aviation.

During the financial year 1921-22 payments under this grant will be limited to a maximum sum of £60,000, and will be made to British companies operating on approved aerial routes. They will be calculated, subject to the above limitation in regard to the total sum available, within the year, on the basis of twenty-five per cent. of the total ascertained gross revenue of each company (exclusive of the Government grant) earned by the carriage of passengers, mails and/or goods, on and after Jan. 1st, 1921.

No differentiation will be made with regard to the class of load carried and payments will be allotted on the return for each period of three months treated separately, provided that the company can show that on a minimum of 45 days in each period of three months (or such other factor of regularity as may be determined later by the Air Council) flights have been completed in both directions by aircraft of British manufacture fitted with British-made engines within a fixed maximum period of time allowed for each journey.

The routes at present approved are London to Paris, London to Brussels, and London to Amsterdam.

Extensions to these routes and additional routes, such as England-Scandinavia, on which the possibilities of a service employing flying-boats or amphibian machines, or a mixed service of sea and land aircraft, can be demonstrated, may be approved from time to time if satisfactory proposals are received by the Air Council.

The maximum time allowed for journeys between London and Paris, between London and Brussels, and between London and Amsterdam will be four hours from aerodrome to aerodrome (or such other time limit as may be determined later by the Air Council).

Payment of the grant will be subject to the production for departmental inspection, when required, of such accounts and records as the Air Council may deem necessary.

Any British company intending to run on the routes and notifying the Air Council of this intention will become an "approved" organisation by fulfilling the conditions laid down.

Such notification should be addressed to the Secretary (C.G.C.A.), Air Ministry, Kingsway, W.C.2., to whom requests for further particulars in respect of the grant should be addressed.

### A Few Comments.

So after all Civil Aviation is to have a subsidy during the present Year of Grace. £60,000 out of the £2,000,000 which the Air Ministry saved—only to have it looted by Mr. Lloyd George's compatriots of the Ministry of Munitions—is not much, but it will probably be enough for the time being, seeing that with so little encouragement there is equally little prospect of £240,000 worth of passenger and freight fares being carried in the year.

However, the grant itself "shows willing," or, at any rate, it shows how scared the Government has been by the downfall of British Aviation, and perhaps it shows how clever the people behind the scenes of the air lines have been in bluffing the Government by withholding financial support from the said air lines. The question is, whether this £60,000 bribe will induce any new capitalist who is a real business man to come into the game and start a new line in time to capture some of the money—which would be the most desirable result—or whether it will merely cause the people who have already made a failure of aviation to come in again.

In any case this £60,000 will be useless unless it is officially announced that a further, and proportionate, subsidy will be forthcoming in the new Financial Year, if by any chance the £240,000 total revenue is exceeded. Nobody with any sense would start a new air line in the hopes of winning a share of this money, while he is assured that if the one existing air line (Handley Page Transport, Ltd.) increases its fleet before he gets going it will take the lion's share of the subsidy in the first half of the year, and leave nothing for his line to take if by clever management he builds up an enormous trade six or eight months hence, when there is no more subsidy left for him to draw. Something must be guaranteed for new lines which may not be able to get going till June or thereabouts.

Also, perhaps something more than mere subsidies might be advisable. For example, if a few titles were held out as a bait they might create confidence in aviation, which a meagre subsidy of this sort would not. So far Sir Sam Waring, Bart., who is understood to have obtained his baronetcy in connection with aviation, is the only civilian so distinguished. Perhaps the offer of promotion to a Barony might induce him to resuscitate the British Aerial Transport Co., Ltd. If the suspended Bat awoke from its prolonged hibernation (it was last seen at the Aero Show in July) it might encourage others to come out and have a flutter on the London-Paris, and similar routes, provided adequate recognition of services rendered were promised.

In any case, the £60,000 seems a paltry amount to offer as an encouragement to an industry which is essential to the Empire, seeing that twice as much is to be paid annually to the London and North-Western Railway for carrying the Irish mails by boats alone—without reckoning what is paid for railway transport. And it is less than a quarter of what was recommended by the Committee which considered the question last June.

Taking it all round the offer is as great an insult to the intelligence of the aeronautical community as the Irish Home Rule Bill was to the majority of Irishmen. Fortunately for the Government aviators cannot coerce our official people in the manner adopted by the more energetic, and perhaps more sincerely enthusiastic, Sinn Feiners, so presumably we shall accept what we are offered instead of insisting on having what we want after demanding twice as much as we expect to get.—C. G. G.

## THE REVIEW OF THE YEAR.

### JULY.

**The Military Forces of the Crown.**—On July 3rd the First R.A.F. Tournament took place at Hendon. Some 60,000 people were present and witnessed the finest display of flying ever seen by the British Public. The R.A.F. Fund benefited by some £7,000.

On July 1st the Zeppelin Airship L.71 was surrendered to the R.A.F. at Pulham, after a masterly display of airship handling by Capt. Heine, the German officer who piloted her.

The *London Gazette* of July 12th contained a long list of orders, decorations, and mentions of R.A.F. officers and men for services in Somaliland, N. and S. Russia, Afghanistan, Kurdistan, India, Waziristan, the Baltic, Palestine, and Egypt during 1919-20, thus showing that the R.A.F. is not yet at peace.

On July 14th this paper exposed the scandalous mishandling of H.M. Aircraft Ship *Ark Royal* by the Naval Authorities in the Black Sea, whereby the personnel were infected with numerous diseases by Russian refugees.

On July 17th the R.A.F. Athletic Association held its Championship Meeting at Queen's Club. The King's Challenge Cup was won by the Uxbridge Team.

On July 17th Air-Marshal Sir Hugh Trenchard, Bart., K.C.B., D.S.O., Chief of the Air Staff, was married to Katherine, widow of Capt. the Hon. James Boyle.

On July 22nd the Zeppelin L.64 was surrendered at Pulham.

(*Continued on page 47.*)

# A NEWSPAPER SCOOP.

The ambition of every newspaper is to secure what is technically called a "scoop" over its contemporaries. A scoop consists in getting a piece of news, or a piece of inside information, before any competitor secures it.

"Scoops" are not confined to newspapers, though the word was used in this particular sense by newspapers before any other trade adopted it. In these days scoops are made by people of every sort. For example, it was distinctly a scoop to be the first to use the mighty Port of London as an aerodrome for a regular air service.

Here is seen the Fairey Seaplane (Rolls-Royce Engine) with which this scoop was made.

This machine was chartered by that enterprising paper the "Evening News," in June, 1919, to carry its products day by day from London to Margate. The pilot was Mr. Sidney Pickles, the well-known Australian aviator.

The machine used to fly from its shed up-river at Isleworth and alight between Waterloo Bridge and Blackfriars Bridge, practically alongside Carmelite House. There it used to take aboard its cargo of the "Evening News," taxi down river and get off, according to the direction of the wind, below the Tower Bridge.

Day after day with remarkable regularity it delivered its cargo at Margate, with the result that the good dwellers in the Isle of Thanet received their afternoon news from London hours before people much nearer Town, who had to depend on the old-fashioned railway for delivery.

Having proved its value and efficiency beyond dispute the service was discontinued merely because under the conditions then existing, the cost of operating an air service was too high to make it worth while for one newspaper to run it. But it proved another point, namely that the Port of London (which is all the Thames below Teddington Lock, where the tide-way ends) is London's best and most natural aerodrome.

Since then the Port of London Authority has been holding special committee meetings and sending representatives to investigate various types of hydro-aeroplanes to see whether other machines can be trusted onto their sacred waters to do what the Fairey Seaplane did successfully for weeks as far back as June, 1919. There is, of course, no doubt about the Fairey, for it was the Fairey, as usual, which did the pioneer work of proving to the Port of London Authority that it possesses London's best aerodrome.

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# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

Since the return of peace the flight of soaring birds has again become a subject of discussion in many quarters. Efforts are being made—certainly in Britain, France, and Germany—to devise man-carrying aircraft which shall be sustained by the energy of the wind.

Capt. Wildeblood's notes printed below are fairly typical of the ideas current among a fairly large number of observers of bird-flight, and the correspondence which follows those notes clearly shows how and why these notes came to be reproduced here.

An article by Capt. Sayers, which attempts to show that nothing in Capt. Wildeblood's observations is inconsistent with what is already well known concerning the behaviour of aeroplanes, is held over till a later issue owing to lack of space.

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An abstract of the American patent granted to Mr. F. Handley Page, covering the well-known H.P. wing, is published in this issue (page 42).

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A letter from Major H. N. Wylie—late of the Technical Department, Air Ministry—and a reply thereto concerns certain recent proceedings before the Comptroller of the Patent Office regarding the validity of certain patents for the metal construction of aircraft.

It is gathered that the dispute in question will in time develop into a very pretty little quarrel.

## SOARING BIRDS.

By CAPTAIN H. S. WILDEBLOOD, M.Inst. C.E., A.F.R.Ae.S.

In the course of my work in India I made some notes regarding soaring birds, and the following extracts may be of interest.

*December 15th,* 1912.—*Meerut.*

The soaring birds have not been very much in evidence since my return to India, chiefly, perhaps, on account of the absence of wind, but when I went out this morning at about 9 a.m., I noticed that there was a continuous breeze sufficient to move the leaves and light branches, and on looking up I found some twenty or thirty cheels and vultures soaring within sight.

The head resistance of the best soaring birds must be remarkably small. I have frequently, and again this morning, watched them glide continuously without a flap for minutes at a time, with head to wind until out of sight, and with no perceptible loss of height. This looks as if the resultant wind pressure acting on them must be as shown in the diagram (Fig. 1).

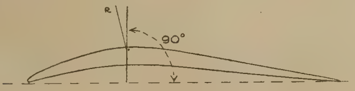


FIG. 1.

To gain height rapidly circling is necessary The gain of height on the up-wind side of the circle is far greater than the loss of height, if any, on the downward side, the former being very evident and the latter imperceptible.

While the bird is circling his inner wing tip is lower than his outer, except when he is facing the wind. He is then horizontal, or nearly so. His greatest cant, or lateral angle of inclination, in circling is usually about 45 degrees or so.

This morning I saw a rather clumsy looking vulture gaining height by circling, and it was noticeable that he was losing ground rapidly, that is, he was drifting to leeward with each circle, and that each time he faced the wind, though he gained height, he was pulled up rapidly and had to turn. A cheel in the vicinity was getting along much more smoothly. There is some virtue in the act of circling which lifts the bird up rapidly, whereas a bird heading against the wind for a long time cannot gain height to any appreciable extent, if at all. The bird certainly, in circling, gains velocity when gliding down wind. As soon as he faces the wind he is visibly carried upwards by it, though his drop in gliding down wind has not been noticeable.

*December 16th,* 1912.

This morning at 9 a.m. there was scarcely any breeze, and there were no birds soaring. The breeze, however, was beginning to rise in light gusts, which stirred the leaves and light branches. Presently a cheel left the top of a tree and tried to rise, but had to flap, and returned to his tree. Later on when the wind got up, the cheels left their trees and commenced soaring. No vultures visible.

*December 17th,* 1912.

A bright, stormy and dust-raising morning, the wind increasing in strength as the sun got higher, and being quite strong by mid-day. The cheels, hawks and vultures were out in force all day. The cheels were more agitated than usual, with frequent movement of wing tips. In circling to gain height they were driven considerably to leeward, but after gaining height they came back by gliding head to wind. The latter manœuvre was obviously by no means an easy one, even for a cheel, the birds evidently having some difficulty in avoiding a too cabré position and being blown over backwards. I was anxious to test my statement to Mr. Ledeboer while I was in England regarding my impression that the soaring birds' wing tips are inclined farther in a high wind than in a gentle breeze, and by breakfast time I had almost come to the conclusion that I had perhaps been mistaken in thinking so, but as the wind rose still higher it appeared to me that the front edge of the wing-tip feathers of cheels soaring high, where the wind must have been very strong, was inclined backwards as much as 45 degrees, which is considerably more than was shown in my sketch of the 15th inst. The plan form appeared to be somewhat as sketched in Fig. 2.

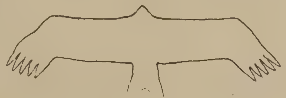


FIG. 2.

But this observation is not an easy one to make, and needs confirmation. The difficulty of observing is increased by the fact that the bird habitually retires his wing tips as shown above, when he is diving. It seems reasonable to suppose that he would do so when heading against a strong wind, as this would help to keep his head down. The automatic lateral balancing action of the wing tip feathers would then come into action. (This automatic lateral balancing action was explained in the Patent No. 11,334 taken out by me on May 7th, 1910, and in the aeronautical papers of the time.—H. S. W., 27/5/20.)

*December 18th,* 1912.

Bright, calm morning. No soaring birds out.

*December 19th*, 1912.

The same. As the wind got up the cheels came out and soared in the open, though they had to flap when they were on the leeward side of my house, where they came in response of my standing invitation to breakfast. I saw one large eagle sailing away to windward at a great height and watched him until out of sight. I could not discern any loss of height. His left wing tip was frequently moved as if to regain lateral balance.

*January 9th*, 1913.

Fresh breeze blowing. Many soaring cheels and vultures up, some at great heights and almost out of sight. There has not been much soaring lately owing to calm weather.

The cheels can float about with, across, and against the wind with very little, if any, loss of height, and with a very small, if any, angle of incidence of the wings. They are able to lie on the wind, facing it, without advancing, sometimes receding a little, and without either rising or falling perceptibly. They can advance indefinitely against the wind with no apparent loss of height, but in doing so they cannot gain height rapidly, as in circling.

From these observations it appears that the resultant wind force acting on them is almost, if not quite, vertical, and may even be inclined forward slightly, so that backward drag is eliminated, and there may even be a slight forward component in its place when a cheel is floating on a wind of considerable velocity, and facing it at a very slight, or zero, or even negative angle of incidence, the latter being understood to be the inclination to the wind of a line drawn from leading to trailing edge of the cambered part of the wing.

If the resultant wind force is inclined forward, as shown in Fig. 5, and if it is of such force and inclination that its vertical component is sufficient to overcome the bird's weight, while its component facing the wind is sufficient to overcome the resistance of the bird in that direction, or its drag, the apparent phenomenon of the bird advancing indefinitely against a strong wind without perceptible loss of height is explained. It is evident, however, that, in order to gain height, it is necessary for him to resort to circling, and so far as I can follow the manœuvre, its phases appear to be as follows :—

The bird is assumed to be facing the wind, he lowers one wing, say the left, and turns to that side, the wind catching him under both wings, blowing him along with increasing velocity. He continues to circle and is now gliding away from the wind, his velocity, relative to earth, now reaching a maximum. Continuing the circle, he is now moving across the wind, to which his back is presented, the outer wing being raised. During these three phases it appears that remarkably little, if any, height has been lost.

In the final phase of the circle he faces the wind, bringing his wings into a horizontal position and increasing his angle of incidence so as to get as much lift as possible, even at the expense of drag, which is now obviously in action, the reduction of velocity, with reference to the earth, being as apparent as the gain of height, and the bird only turning again when his forward velocity with reference to earth has been almost expended in the production of lift.

The cheel is not the only bird possessing these powers. The vulture, saras, eagle, hawk, and other birds also have them in a marked degree, but the cheel is very common and is a most efficient soarer. In the evening after the wind dropped cheels were flapping heavily and alternately gliding from point to point with a perceptible though small gliding angle.

*January 10th*, 1913.

Strong wind. Cheels soaring very high, facing wind, moving about and working together as a rule. The front edge of the outer primary feather is inclined backwards at about 45 degrees. On the other hand there is a vulture soaring at a lower level with wings fully extended, the front edge of the outer primary being almost in line with the front edge of wing, which is at right angles to the line of flight.

*January 25th*, 1913.

The other day at Agra I saw in the distance thousands of large vultures soaring at the slaughter-house. I saw one of these soaring near me, and the wing-tip movement, apparently made with the object of depressing and retarding that wing, was very noticeable in these large birds. (The theory underlying this was described in my Patent 6,642, of March 16th, 1910, and in the Aeronautical papers of the day.—H. S. W., 27/5/20.) This morning, when the breeze began to rise, the cheels got up and flapped and glided heavily until clear of the tree-tops, when they circled and soared with an occasional flap or two. The cheels that came down for breakfast always have to flap to ascend from the corner between my house on the west or windward side and the kitchen on the south. I saw two of them collide in mid air, with their heads, this morning, with a considerable crash, but they flew away at once, apparently none the worse for the collision.

*April 7th*, 1913.

To sum up my observations up to the present the following points seem to be worthy of consideration.

1. Soaring birds seem to soar only when there is a perceptible breeze, and to prefer to soar in a strong wind.

2. The theories of upward currents, pulsating winds, and sun soarability, though not disproved by my observations, receive no support therefrom.

3. Whether all, or any, soaring birds recede their wing-tips in order to obtain lateral stability is at present doubtful, though there is evidence that some of them do so when there is a strong wind blowing. More evidence on this point is needed.

4. Soaring birds appear to move the wing-tips only, on the side which they wish to depress. This appears to prove that they rely on the use of the negative angle, on one wing-tip only, for altering or introducing lateral cant, and that they do not move the other wing or wing-tip for this purpose.

5. The action in turning to right or left is not easy to follow, but is conceivably due to the use of the negative angle in a wing-tip which induces turning and canting simultaneously.

6. The birds swoop down by receding their wing-tips.

7. It is obvious that a soaring bird like the cheel can, in a wind, reach any point he desires and at any height, without a single flap of the wings; he can travel for miles head on to a gale, with no perceptible loss of height; and he can, by circling, rapidly gain increase of height.

8. These apparent phenomena are, I think, not adequately explained by any accepted theory of the present day.

9. The matter is of great importance, and will probably influence the future of flight to a much greater extent than any of us now recognise. It may indeed open up the way for the yacht of the air, if we can solve it, and the possibilities in this direction are boundless.

10. As a basis for discussion I propose the following tentative theories :—

1. That within certain angles of incidence, and at certain relative air speeds the resultant wind force acting on a soaring bird is inclined forward at an angle with the vertical, and that this enables the bird to travel forward against a strong head wind with no loss of height.

2. That in order to gain rapid increase of height the manœuvre of circling is adopted, and that this consists, broadly speaking, of a sharp run down wind at a small angle of incidence with very little loss of height, and of a rush up wind at an increased angle of incidence with great increase of height. In order to prevent loss of position relative to the earth, the bird manœuvres in accordance with theory (1) during part of the time that he is facing the wind. The circling manœuvre might be diagramatically shown as in Fig. 3, if plotted in one plane instead of in a spiral.

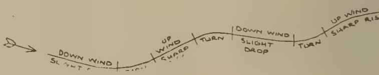


FIG. 3.

3. That the resultant force of the wind, gravity and drag, when the bird is soaring and advancing against the wind, as in manœuvre (1), may be represented graphically as in Fig. 5.

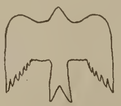


FIG. 4.

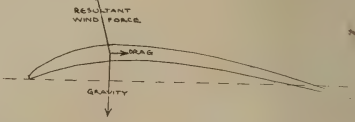


FIG 5.

*April 25th*, 1913.

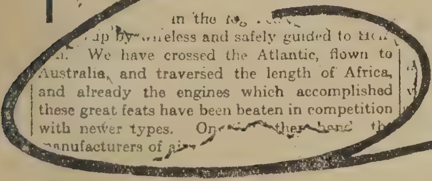
I have just seen a cheel soaring in a very light breeze. He started at the level of the roof of my house, and in two minutes had risen, I should say, at least two hundred feet without losing any headway against what slight breeze there is, and indeed making a little headway of perhaps 50 feet against it. There were other cheels soaring higher up at about 1,000 feet perhaps. It is a somewhat hazy day, with clouds about, but the sun was shining with medium brightness while I watched the cheel.

*May 1st*, 1913.

I have just seen, during a high wind, a cheel soaring upwards rapidly, and at the same time advancing a little, and facing the wind all the time.

*July 6th*, 1913.

Near Delhi yesterday I saw some birds flying in an *andé* (windstorm) while the gale was at its height. First I noticed



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a cheel soaring, head to wind. The wings were laid right back, the wing-tip feathers quite parallel to the body (Fig. 4).

Then I saw crows in the same attitude, and finally pigeons, all soaring and flapping alternately. Even the doves and jays tried to do the same, though cautiously keeping near the ground, and looking like beginners learning to skate. The wind velocity was terrific, and when a cheel, or crow, or pigeon turned and raised a wing to take the force of it, the bird shot away at a marvellous speed, turning again, however, quite easily, at will.

I therefore think that, when in difficulties, the birds do make use of the lateral righting effect of feathers, inclined backward, and having quills on their outer edges, an arrangement which I have found to have so remarkable an effect in models of aeroplanes. I do not, however, overlook the fact that the reclining backwards of the wing-tips may also be necessary for longitudinal stability or other reasons.

*July 10th*, 1913.

This morning, at sunrise, I was watching the various modes of flight adopted by the birds about here. There seems to be no hard and fast line between soaring and flapping birds. At one end of the scale is the cheel, which habitually soars, but which also invariably flaps when there is no wind, and at the other end we have the small flapping birds, and beyond the scale the buzzing insects, but between the extremes we have the birds which adopt an undulatory motion, while flapping and gliding alternatively, and sometimes we see notorious flappers like doves and pigeons gliding for short distances.

The beautiful soaring cheel is a clumsy flapper and beats the air heavily. He is indeed like a fish out of water when the wind drops, and he has to do a journey.

*July 18th*, 1913.

This morning I watched two cheels circling to gain height over the open parade ground. At every circle they were driven back to leeward, and often flapped, and finally they lost half a mile of ground in gaining say 200 feet of height. The breeze was light at the time.

Presently the wind strengthened, and one of the cheels advanced against it at a uniform height of about 100 feet on a perfectly horizontal course for a distance of half a mile, and without a flap. There was no doubt as to the course being horizontal as he was soaring across a dead flat open plain, and the horizon was perfectly clear below him.

Soon after I saw two or three cheels, farther away, soaring in circles. The change in wind velocity was not great, though it was noticeable, and there were no other changes in the conditions that I could see during the half hour that It was watching. The sun was bright and the weather hot and stormy. I particularly noted that the attitude of the cheel was as nearly horizontal as I could judge, the angle of incidence being apparently nil.

*July 28th*, 1913, *Mussoorie*.

Yesterday from my window in the Charleville Hotel I saw some cheels soaring by, circling in and below the clouds. The atmosphere was full of moisture, and the altitude about 7,000 feet; there was no sun, and the temperature was mild; and there was a light wind. Watching them just above the verandah railing, I could not discern any loss of height in the down wind half circle, whereas the rise against the wind was clear enough. The birds evidently did not wish to rise into the cloud, presumably because this would have interfered with their view of the hillside below. In the hills there are naturally many up currents which are liable to upset one's observations.

*August 3rd*, 1913, *Meerut*.

If the above views[*] are correct, it is conceivable that they may influence, to some extent, certain details of aeroplane design. For instance, biplanes and multiplanes might be arranged by extreme staggering, or otherwise, so as to take advantage of the region of low pressure below the wave under the rear middle part of the vortex as in Fig. 6.

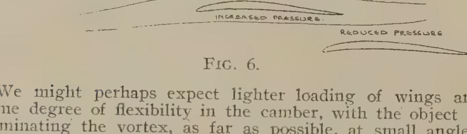

Fig. 6.

We might perhaps expect lighter loading of wings and some degree of flexibility in the camber, with the object of eliminating the vortex, as far as possible, at small angles, and attaining a forward component of the wind force, and we may even ultimately see the birth of the sailing yacht of the air.

## WILDEBLOOD VERSUS C. G. G.

### Persistence Rewarded.

The following correspondence, passed between Capt. H. S. Wildeblood and the Editor of this paper, will explain itself:

November, 1920.

Sir,—Would you care to publish the enclosed notes on Soaring Flight, which were written in India in 1912-13? It is only fair to tell you that the leading aeronautical authorities have rejected them and prefer to adhere to their theory of rising currents of air. My observations were, I think, nevertheless, correct, and they do not appear to fit in satisfactorily with the rising current theory (see the descriptions of circling during soaring, and of soaring birds travelling against a head wind). If my theories are mainly correct, and I think they are, there is still hope for cheaper and safer flying.

The patents referred to were abandoned during the war. I have included the extract of Aug. 3rd., 1913, as it seems to be of interest in view of the current topic of the Handley Page wing.

Yours truly,

(Sgd.) H. S. Wildeblood.

November 12th, 1920.

Sir,—Thank you for the accompanying matter. This, unfortunately, does not seem to demonstrate anything, and appears to be merely a record of observation, the phenomena of which seem to be explicable by quite ordinary methods. For example, the paragraph on the first page commenting on the fact that a bird soars by circling, merely indicates that there was an upward current at that spot which was bent over somewhat to leeward by the prevailing wind.

If you have ever been in a Handley Page which has had one wing pushed up in the air till the machine heeled over to about 30 degrees by an up-current from a wood 2,000 feet below and at least 200 yards before the machine came over the wood, you would find very little difficulty in explaining all these questions by the simple operation of upward and leeward currents.

(Sgd.) C. G. Grey.

November 16th, 1920.

Sir,—I am much obliged to you for frankly criticising my notes. That is what I want, but when the Aeronautical Society tell me that the notes are not of sufficient interest in the present stage of aeronautics to justify publication, I am non-plussed. I think I can meet your criticism, if you will allow me to try.

First, consider the observation that a soaring bird can travel steadily head to wind for an indefinite distance without flapping and without loss of height. I agree that a steady and continuous up-current over the whole length of his flight would enable him to do this, a clever combination of lift and glide against the wind, but is it likely that he would find such a steady and continuous up-current over, say, a mile of flat ground like that of the Meerut Parade Ground, where I have often seen this manœuvre carried out?

To get such a condition, two air currents a mile in width have to meet and ascend along the straight line of the bird's flight, which is most unlikely. The fact that I have seen several soaring birds carrying out the same manœuvre at the same time and at long distances apart, and that I have seen it carried out under so many different circumstances as regards time, place and direction, though always head to wind, makes the possibility of two air currents meeting and being deflected upwards along a straight line in all such cases extremely remote.

Also, if up-currents came into the matter at all, one would expect to see the result of puffs and lulls in the bird's movement, instead of which he travels in a dead straight line as far as can be judged by the eye. It also seems that the bird would probably prefer to reach the desired spot by first ascending in the best part of the up-current and then gliding against the wind.

Next let us consider the circling manœuvre to gain height. If this is due to an up-current how can we explain the fact that every time the bird runs down wind he does so without any gain in height and every time he faces the wind he is carried up with a visible jump of perhaps six feet or more. I cannot answer for the exact dimension, which is difficult to observe, and which I, therefore, did not enter in my notes, but I am not far out in my estimate. How is it that we *never* see him carried upwards during his run down wind?

Why do we *never* see soaring birds when circling taking advantage of the obvious up-currents that do some times take place in India on *calm* days, viz., the "dust devils," when columns of swirling dust rear their heads hundreds of feet above the ground? On the contrary, the number of soarers always increases as the wind rises in force. And, generally, if up-currents satisfy us and the birds, why don't we see flapping birds also taking advantage of them and circling in them to gain height like the true soarers.

I am not denying that up-currents sometimes exist, or that they affect the flight of birds and aeroplanes. I have seen

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[*] In making the above extracts I have omitted, for want of space, the theories referred to. They consist generally, of an examination of the problem of flight with the aid of Bernouilli's theorem of incompressible fluids.

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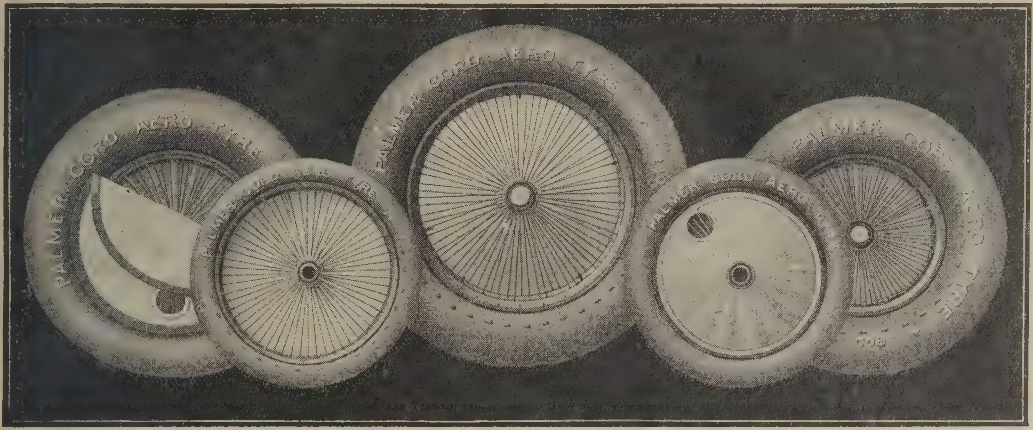

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| ,, | 17 | 72.39 | 12.7 | Central |
| 450×60 | 30 | 89. | 31.75 | Central |
| ,, | 138 | 130. | 38.09 | Central |
| 575×60 | 21 | 160. | 28. | Central |
| ,, | 34 | 150. | 31.75 | 104/46 |
| ,, | 111 | 150. | 38.09 | 104/46 |
| 650×65 | 78 | 178. | 44.45 | 132/46 |
| ,, | 79 | 178. | 44.45 | Central |
| ,, | 100 | 178. | 38.09 | 132/46 |
| ,, | 101 | 178. | 31.75 | 132/46 |
| 600×75 | 21 | 160. | 28. | Central |
| ,, | 34 | 150. | 31.75 | 104/46 |
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| 700×75 | 78 | 178. | 44.45 | 132/46 |
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| 700×100 | 77 | 178. | 44.45 | 132/46 |
| ,, | 92 | 185. | 55. | 135/50 |
| ,, | 95 | 185. | 55. | Central |
| ,, | 96 | 178. | 55. | 132/46 |
| ,, | 99 | 178. | 38.89 | 132/46 |
| ,, | 112 | 150. | 38.09 | Central |
| 650×125 | 119 | 178. | 55. | 132/46 |
| 750×125 | 77 | 178. | 44.45 | 132/46 |
| ,, | 92 | 185. | 55. | 135/50 |
| ,, | 95 | 185. | 55. | Central |
| ,, | 96 | 178. | 55. | 132/46 |
| ,, | 99 | 178. | 38.89 | 132/46 |
| ,, | 112 | 150. | 38.09 | Central |
| 800×150 | 82 | 185. | 55. | 135/50 |
| ,, | 85 | 185. | 55. | Central |
| ,, | *36 | 185. | 55. | 135/50 |
| ,, | *40 | 185. | 60.32 | 135/50 |
| 1000×150 | 131 | 220. | 66.67 | Central |
| ,, | 102 | 185. | 55. | 125/60 |
| 1000×150 | 141 | 250. | 80. | Central |
| ,, | 201 | 185. | 60.32 | 125/60 |
| ,, | 209 | 185. | 55. | Central |
| ,, | 210 | 185. | 60.32 | Central |
| 1000×180 | 148 | 220. | 80. | Central |
| ,, | 149 | 185. | 55. | Central |
| 900×200 | 107 | 185. | 55. | Central |
| ,, | 108 | 185. | 55. | 125/60 |
| ,, | 128 | 220. | 66.67 | Central |
| ,, | 137 | 250. | 80. | Central |
| ,, | 202 | 185. | 60.32 | Central |
| 1100×220 | 134 | 220. | 66.67 | Central |
| ,, | 136 | 250. | 80. | Central |
| 1250×250 | 133 | 250. | 80. | Central |
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this often enough at the edges of cliffs or ships, buildings and trees, but this is a vastly different thing to the much more important phenomena I have described. It is merely an occasional accident and cannot account for the widespread soaring observed.

I realise that I am faced with the difficulty that you are dependent on the veracity of my observations and that I have advanced a theory that is radically opposed to existing beliefs. Some of my friends to whom I have explained the theory seem to think it is akin to one of "perpetual motion," or "something for nothing." They may as well say a sailing ship, tacking up wind, gets "something for nothing."

I hope you will take the matter up. I don't think you will find I have let you down. I am so convinced that the notes are worth publishing that I have persevered to that end since 1913, omitting the war period, in spite of much discouragement.

(Sgd.) H. S. Wildeblood.

November 19th, 1920.

Sir,—Thank you very much indeed for your letter of the 16th. When the Aeronautical Society says that the notes are not of sufficient interest in the present stage of aeronautics to justify publication, I think I know what they mean. At any rate, that is frankly my own reply as regards my own paper. The point is that advertisements are scarce, and, therefore, reading matter pages are scarcer still. On the other hand an immense amount of practical flying is going on and quite a large amount of experimental work is in progress, and there are a number of engineering problems to be discussed in connection with aircraft, all of such immediate interest and importance that the question of why birds behave as they do is not of sufficient immediate interest to displace the things which we have to publish.

If we had as much space to fill in The Aeroplane as we had during the war, and if we had about half as much to write about as we have at present, then it might be possible to find room for the description of the events which you record. To be more brutal still, it is frankly a matter of £ s. d. Birds do not advertise, aeroplane makers do. We can only keep the paper alive by means of advertisements, therefore we have to describe aeroplanes and how they fly, instead of birds.

I cordially agree with you that the study of birds' flight is interesting, but I think it has to be studied with very great care to prevent oneself from setting too much store on what birds do. There is always a tendency to imagine that because birds fly pretty well, therefore aeroplanes should imitate them. As a matter of fact, I believe that, power for power, and weight for weight, aeroplanes fly still better. At any rate an aeroplane can get off the ground in a shorter space compared with its own length than can a bird, and an aeroplane can perform all sorts of tricks in the air that no bird ever attempts.

I am by no means sure that it is worth while trying to learn anything from studying birds.

I always remember the argument on this same question several years before the war, when one of the disputants said that it was a mistake to study birds when considering the design of aeroplanes, "For," said he, "when the Chief Designer of the Admiralty is about to design a Dreadnought he does not do it by contemplating a bloater!"

However, to tackle one or two of the points which you mention, I do not suggest that it is necessary for two currents to meet in order to produce an up-current. I imagine that, given a mile of flat ground as at Meerut, with the sun pouring down on it, there must be an upward current over the whole of that area so that any bird coming into that area would receive a lift. When they are going down wind in that area they are quite possibly still rising, though they may not appear to be so, but on the other hand, they may find that it pays them better to shoot off down wind purposely, losing height slightly and thereby gaining speed, so that when they do a sudden turn into the wind they come head to wind with considerable momentum, and so are jerked upwards by the impact as well as receiving the natural lift of the up-current.

There is something that we do not yet understand about the formation of air waves, something analogous to the fact that the back of a breaker at sea is long and smooth, while the front is abrupt and tumultuous. At any rate, any pilot with a delicate sense of touch will tell you that an aeroplane will always climb better head to wind than it does when flying down wind. You will see something of my idea illustrated in the fact that the front of a cloud is always well-shaped and firmly outlined, whereas the back of the cloud is apt to be straggly.

The delicate sense of feel of a bird acquired by thousands of generations of flying ancestors probably allows him to tell exactly what the wind is doing, whereas we who have only been flying for a few years do not yet know enough to tell merely from feel whether a particular little bit of air is what we want to give a lift or not.

I can quite understand that birds do not take advantage of upward currents on calm days. A plain, straight, upward current from a baked parade ground, or a big patch of bare rock, would be very thin air in which to fly. I have seen aeroplanes refuse to get off a hard-baked, dry aerodrome when they would fly quite well over other country. And, of course, no bird would ever think of sitting in a dust devil to get a lift, because, as I have said earlier, birds do not like performing acrobatics at any time, and certainly no bird would like getting into a flat, upward spin out of control.

I do not in the least doubt the accuracy of your observations, but I do very much doubt your deductions from them. I think Mr. Hankin had also some curious theories as the result of observing bird flight in India, but I have never discovered anything either in his or your observations which could not be explained quite easily by what we already know of the behaviour of air from the flying of aeroplanes.

(Sgd.) C. G. Grey.

November 26th, 1920.

Sir,—I must thank you very sincerely for your letter of the 19th. It is most refreshing to find anyone who can be perfectly frank and not afraid of putting his views on paper. I will be as frank with you, and I hope you will forgive me for not agreeing with you. I must apologise for the delay in replying, due to work and family illness.

You know, as well as I do, that civil aeronautics is sick unto death, and the chief reasons are that it is too expensive, and, as things are at present, too dangerous; the latter being partly due to landing difficulties and partly to engine risks.

I am no visionary, as you may perhaps think. My time has been fully occupied, since the beginning of the War, in connection with the minor and gradual improvements that have taken place in the aeroplane as it stands to-day, but I have seen several firms, with which I have been intimately connected, go under, and I foresee the collapse of others, so far as aviation is concerned.

At such a time, it seems wise to tear oneself away from the detail work for a moment, and to take a more general view.

I believe that my notes will be helpful to others who are struggling with such problems as the Alula and Handley Page wings, and the slow landing of aeroplanes. In a recent Royal Aircraft Establishment report on the latter it has been truly remarked that improved stability will be a necessary adjunct to slow landing.

In my own experiments I found, for instance, that the addition of the principles of wing-tip feathers and negative angle ailerons, combined with the usual lateral and longitudinal dihedral, did give perfect stability at the slowest speeds.

As regards my other theory, of a possible forward resultant of air forces, it looks to me, after a recent examination of the German aircraft now in this country, that the Germans, with their thick, deeply cambered planes, have got the lead over us in this direction.

I am sorry, but I cannot agree that, power for power, aeroplanes fly better than soaring birds, which fly without the expenditure of any power from their own muscles. As regards getting off the ground, a soaring bird, given a suitable wind, can jump straight off the ground and commence to soar at once.

As for tricks, no soaring bird is so foolish as to indulge in spinning nose dives or other useless manœuvres, but he has infinitely better stability and controllability and manœuvrability than any aeroplane hitherto constructed.

The comparison between a Dreadnought and a bloater was not, I think, a happy one. The bloater does not spend his life with his back out of water, nor does he carry guns, but the bloater is, nevertheless, worth studying for his streamline form and the disposition of his tail and fins, and though a soaring bird and an aeroplane are two different things, we have already learnt something about wing, body and tail form from the former, and we can learn still more, if we will.

Your alternative theory of an upward current over the whole of the Meerut Parade Ground, due to the sun pouring down on it, would necessitate an air current coming out of the ground, if you discard the possibility of two currents meeting along the straight line of the soaring birds' advance against a head wind.

The back of a breaker at sea is long and smooth, while the front is abrupt and tumultuous, because, I take it, the wind drives the surface water along until it mounts the water below and finally tumbles over it.

Your remark that a plain, straight, upward current from a baked parade ground would be very thin air in which to fly, helps my argument. I quite agree. It was with the utmost difficulty that I got my own aeroplane to leave the ground at all on the Meerut Parade Ground. Without a considerable

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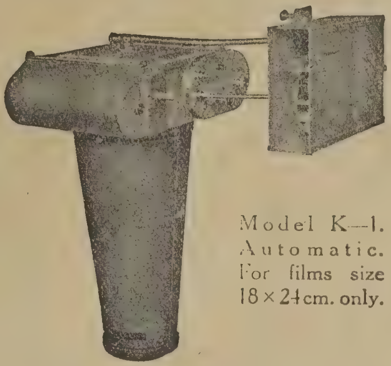

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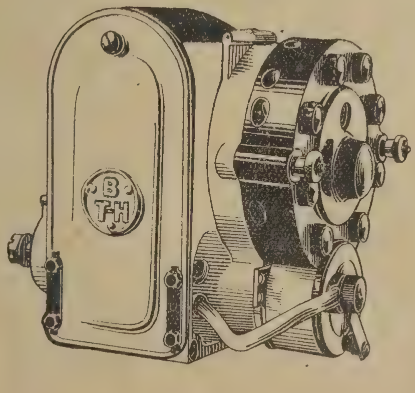

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head wind, the soaring birds would never have been able to soar and to advance, *without a flap*, for about a mile against the wind, without losing height, nor would they have selected a hot parade ground for the manœuvre.

I quite appreciate the £ s. d. difficulty. What would you charge me for advertising space taken up? If not too much, I would pay for this, as I am convinced that publication would benefit us all, though it seems hardly fair that I should pay for it. I have long ago given up any hope I ever had of making money out of my investigations. I dropped my patents during the war. (Sgd.) H. S. Wildeblood.

December 2nd, 1920.

Sir,—Thanks so much for yours of December 1st, and the notes on soaring birds.

Enclosed herewith is an article from Captain Sayers replying to some of your recent remarks. I propose, if I can possibly find space in the paper at any early date, to publish first of all your notes, which you have just returned, and then the rest of the correspondence relating thereto. I think that the whole subject treated in this way would probably be quite amusing to our readers.

If you have any objection, of course, I will not publish the correspondence, but it may appeal to you, as it does to me, to have both sides of the question stated in this way.

(Sgd.) C. G. Grey.

December 3rd, 1920.

Sir,—Many thanks for your letter of December 2nd. I think your offer is a very fair and sporting one, and I heartily agree to your suggestion.

(Sgd.) H. S. Wildeblood.

[Note.—The article by Capt. Sayers referred to in the penultimate letter will be published in the next issue of this journal. And, of course, Capt. Wildeblood's sporting offer to pay for advertising his birds has *not* been accepted.—C. G. G.]

## THE HANDLEY PAGE PATENT.

The following abstract of the American patent No. 1353666, granted Sept. 21st, 1920, to Mr. F. Handley Page will make clear the specific features claimed for the H.P. wing:—

. . . . It is already known that when a wing is inclined at an angle to the air through which it passes that the lift coefficient of such a wing increases with the increase of its angle up to a certain critical angle which varies between 12 degrees and 25 degrees. After this critical angle is passed the value of the lift coefficient of the wing decreases owing to an effect called a "burbling" taking place over the forward portion of the upper surface of the wing and it no longer exerts its full suction effort.

Now the primary object of the present invention is to provide means or a construction whereby this burbling effect on the back or upper surface of the forward portion of a wing can be overcome, so that the same lift can be obtained at slower speeds than is now possible even when the wing is inclined at a greater angle than heretofore to the air through which it is driven.

For this purpose and according to this invention, the wings and similar members are constructed with a comparatively narrow through slot or, what is equivalent, a series of slots in line, near the nose or front portion, said slot or series of slots extending substantially throughout the wing in a direction transverse to the direction of flight, in order that it or their influence may be exerted at all points of the wing.

In order to produce this result it is necessary that the auxiliary wing should be set at an angle relatively to the main wing so as to mask its leading portion without being in contact with it, by having the nose of the auxiliary wing at the approximate level of the nose of the main wing, and having its angle of incidence less than the angle of incidence of the main wing.

It is preferable to make the rear edge of the auxiliary wing (or the portion of the main wing forming the front wall of the slot) terminate at about the same height above the chord of the main wing as the highest point of the camber of such wing.

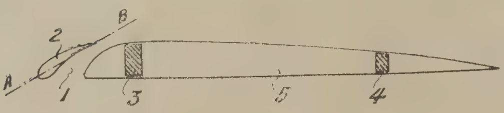
A wing may be constructed or fitted with a plurality of such auxiliary wings forwardly located, one auxiliary wing rearward of the other, and in such case it is preferable that the slot formed between the most forward auxiliary wing and the next rearward auxiliary wing should be of greater dimension than the next rearward slot, so that the most forward slot presents the largest openings on the top and bottom surfaces of the wing and the most rearward slot has the smallest openings.

In carrying out the invention, the opening of each slot formed between the auxiliary wing and the main wing has its opening on the upper surface of the wing at a short distance rearward of its opening on the under surface, and usually the dimension of the opening of a slot on the under surface of the wing in the direction of the line of flight is made greater than the opening on the upper surface.

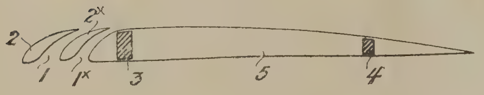
The walls of the slot or slots are preferably curved rearwardly from the lower opening to the upper opening, it being a practical consideration that the air passing through the slot should be directed with a minimum possible change of direction from the under surface to the upper surface.

The invention further provides means whereby the slot or slots formed between the auxiliary wing or wings and the main wing can be mechanically wholly, or partially, opened or closed preferably by the aviator while in flight.

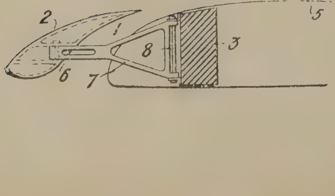
—Fig. 1.—



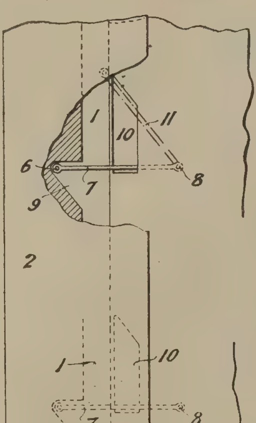
—Fig. 2.—



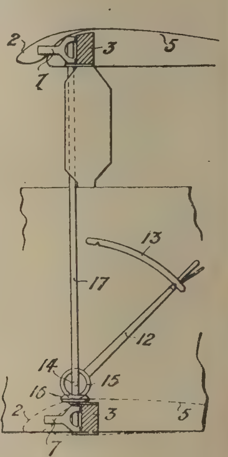
—Fig. 3.—

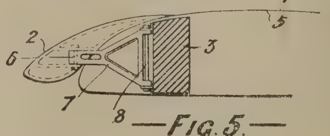


—Fig. 4.—



—Fig. 7.—





—Fig. 5.—

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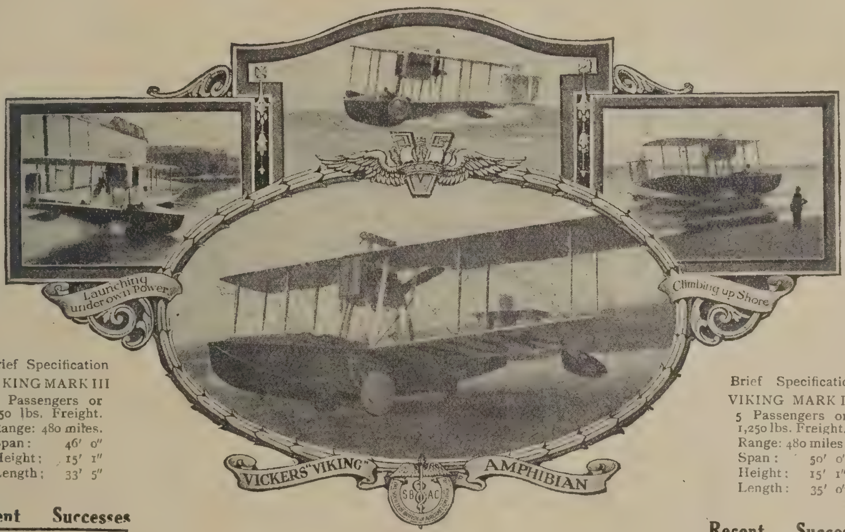
Flying Boats for Commercial & Naval Use.



Brief Specification
VIKING MARK III
5 Passengers or
750 lbs. Freight.
Range: 480 miles.
Span: 46' 0"
Height: 15' 1"
Length: 33' 5"

Brief Specification
VIKING MARK IV
5 Passengers or
1,250 lbs. Freight.
Range: 480 miles.
Span: 50' 0"
Height: 15' 1"
Length: 35' 0"

**Recent Successes**

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

1. Shortest time in "unsticking" from water.
2. Fastest time over a given circuit.
3. Climb to 1,000 metres.
4. Altitude with full load.

Depôts:
MANCHESTER—Cathedral House, Long Millgate (Temporary Address).
BIRMINGHAM—Vickers House, Loveday Street.
NEWCASTLE—Commercial Union Buildings, Pilgrim Street.
GLASGOW—Vickers House, 247, West George Street.
BRISTOL—55. Park Street. BELFAST—26a, Arthur Street.
LEEDS—Greek Street Chambers, Park Row.
NORWICH—16, White Lion Street.

**Recent Successes**

The Vickers Viking was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION September. 1920.

Aviation Department,
VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

Figure 1 shows by a diagram view a wing section formed with a single through slot comprised between a front portion or auxiliary wing and a main rearward portion or main wing, said slot extending in length transversely of the direction of motion of the wing through the air, and Fig. 2 is a similar view showing a plurality of such slots according to this invention.

Figs. 3 to 7 show an example of construction of the invention in which the auxiliary wing is pivotally connected to the main wing so that the slot aforesaid can be opened or closed, and also illustrates an example of the means by which such opening or closure of the slot can be effected by the aviator during flight. That is to say, the false leading edge (or auxiliary wing) approaches or recedes from the rest of the wing in the manner of a parallel ruler.

## STEEL CONSTRUCTIONAL PATENTS.

The following letter has been received :—

14, Church Road, Richmond, Surrey.
January 3rd, 1921.

"Sir,—In you issue dated December 8th you give certain information about an opposition to one of my patents, which is misleading, and I shall be obliged if you will, as far as possible, put the matter right by publishing this letter.

"Under the heading 'Aircraft in Parliament' you report certain questions and answers in Parliament, and add thereto :—'It would appear that Mr. Churchill was not fully informed in his answer to these points. One is informed that . . . . the opposition (it was not the Steel Wing Co.'s) was successful to the extent that the Comptroller ordered three very important amendments to be made in Mr. Wylie's patents.'

"I am in a position to state that the 'One' you refer to as being informed was in reality misinformed. The opponents lost their case and were required to pay exceptionally heavy costs.

"The amendments ordered by the Comptroller were amendments only in the workmanship of the specification and aimed at making the meaning of the specification more clear. Their effect is merely to make the specification stronger than previously. If this is what the opponents aimed at I am indebted to them.

"If you are in any doubt as to the correctness of the above I shall be very glad to show you a copy of the complete decision, and, if you desire that your readers be fully informed with regard to it, I shall be happy to let you print it.

"(Signed) H. N. WYLIE."

The following reply to Major Wylie's letter has been supplied :—

The grounds of opposition to Major Wylie's application for a patent were :—

(a) That the nature of the invention or the manner in which it is to be performed is not sufficiently or fairly described and ascertained in the complete specification.
(b) That the invention has been claimed in the complete specifications of the following British patents—namely, Nos. 8522 of 1912, 26147 of 1913, 121006, 125748, 128322, 128663, 129023, and 131019. And
(c) That the applicant obtained the invention from the opponents.

Major Wylie had worded his original application so widely that it covered or sought to cover nearly every form of girder made of thin corrugated metal, and he also claimed that prior to his application the use of longitudinal corrugations were unknown.

The opposition was successful in having the patent amended in such a way that the Comptroller finally referred to it as "a very narrow invention," and its application was, as the result of the opposition, limited to girders constructed on a specific principle—i.e., to girders in which the radius of the curves were in certain proportion to the thickness of the metal, and the Comptroller proceeded to say :—

> "It is admitted, however, that longitudinally corrugated booms or flanges are well known, and frequently used in this connection; and it is further shown in Mayrow's specification No. 26147 of 1913 (Fig. 9) [which with some fifty other patents bearing on this subject are the property of the opponents] that longitudinally corrugated webs have likewise been employed in girders and spars for similar processes. The properties of each are to a certain extent known, and I think it would be difficult, if not impossible, at the present time to put forward a valid claim for the mere combination of the two without some principles or some conditions defining their use.
>
> "It was practically admitted at the hearing that, unless some scientific knowledge and some scientific principles were applied to such a combination, it might fail to be an effective structure for the purposes required. The applicant, in his examination at the hearing, contended that adequate scientific principles of construction are laid down in the specification itself, and that these would be clear to anyone who had sufficient scientific and technical knowledge upon the subject.
>
> "As regards this point, it is generally admitted that a complete specification must be intelligible to a competent workman, possessing the ordinary skill and knowledge of that branch of the useful arts to which the invention relates. It is not necessary that it should appeal to persons ignorant of the subject-matter, but, on the other hand, it must give such directions as will enable the skilled scientific workman to carry out the design without elaborate experiment or calculation. I am not prepared, and I do not think it within my province, to decide whether the present specification has sufficiently explained the principles upon which these constructions are based. I think that is a matter for the Courts hereafter, if their aid is invoked."

As Major Wylie knows, it is intended to invoke this aid. So it is not proposed to discuss that aspect further at present.

It is felt also that, as Major Wylie's action is, as an officer connected with the Air Board, part of the subject-matter of an inquiry now being held, it would be improper to comment on it at the moment.

As regards ground (c), the Comptroller held that Major Wylie had not *directly* obtained the inventions from the opponents. The question as to whether it had been *indirectly* so obtained owing to the facilities which Major Wylie enjoyed owing to his official position could not be gone into owing to the statutory limitation of the Comptroller's powers, and that question will be gone into in another place.

## THE INSTITUTION OF AERONAUTICAL ENGINEERS.

NOTICES, January, 1921.

*Council.*—The Council met on Jan. 4th.

*Elections.*—Member : F. T. Hill. Associate Member : V. G. Steer-Webster. Pilots : J. L. Mayer, D.F.C., Captain W. F. Hamilton. Associate : J. C. Buckley, Flying Cadet, U.S.

*Auditors.*—Messrs. Worrell, Edwards and Co. have been formally appointed to audit the accounts of the institution to Dec. 31st, 1920.

*General Meeting.*—At a General Meeting to be called in the near future the Council will present their report for the year 1920, with financial statement and balance sheet.

*Donations.*—The Council desire to express their thanks to Lt.-Col. R. de Villamil for the gift of a copy of his book on soaring flight, and to the Technical Publishing Co., Ltd., for the gift of a copy of "The Motor, Marine and Aircraft Red Book, 1920", also to Mr. Cor Besser, Honorary Member, for the gift of copies of recent Dutch publications.

*Annual Subscriptions.*—The Annual Subscription for 1921 became due on Jan. 1st. In the case of all Members other than Students the annual subscription is Two Guineas. In the case of Students it is Half-a-Guinea.

January 5th, 1921. DOUGLAS SHAW, Secretary.

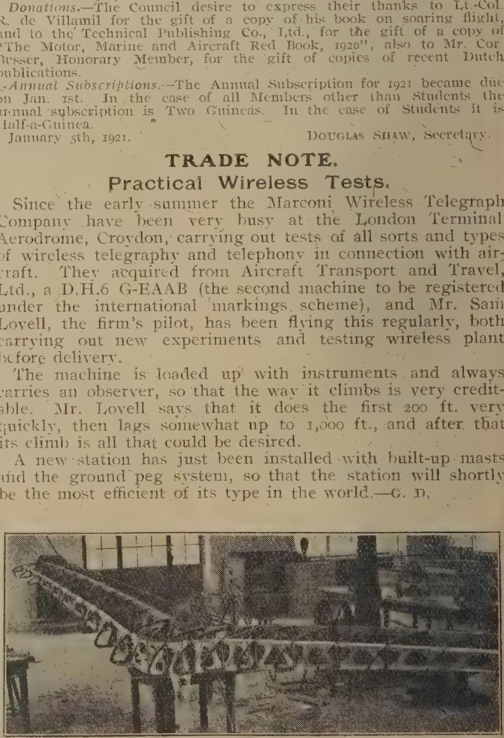
## TRADE NOTE.

### Practical Wireless Tests.

Since the early summer the Marconi Wireless Telegraph Company have been very busy at the London Terminal Aerodrome, Croydon, carrying out tests of all sorts and types of wireless telegraphy and telephony in connection with aircraft. They acquired from Aircraft Transport and Travel, Ltd., a D.H.6 G-EAAB (the second machine to be registered under the international markings scheme), and Mr. Sam Lovell, the firm's pilot, has been flying this regularly, both carrying out new experiments and testing wireless plant before delivery.

The machine is loaded up with instruments and always carries an observer, so that the way it climbs is very creditable. Mr. Lovell says that it does the first 200 ft. very quickly, then lags somewhat up to 1,000 ft., and after that its climb is all that could be desired.

A new station has just been installed with built-up masts and the ground peg system, so that the station will shortly be the most efficient of its type in the world.—G. D.



**A RECORD GLIDER.—The Wing Structure of the Klemperer Glider which made a glide of over 1,800 metres at the German Gliding Competition in the Rhön last summer. The machine is an extremely well-built cantilever monoplane.**

DH

D.H. 16

D.H. 18

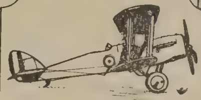
D.H. 1.

D.H. 2.

D.H. 14

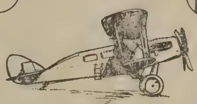
D.H. 3.

D.H. 11.



D.H. 4.

D.H. 10A.

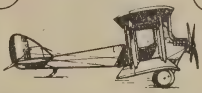


D.H. 4A.

D.H. 9R.

D.H. 9A.

D.H. 9.



D.H. 6.

D.H. 5.

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|---|---|---|
| ENGINE | 450 H.P. Napier Lion. | 450 H.P. Napier Lion. |
| SPEED (Fully Loaded) | 136 M.P.H. | 128 M.P.H. |
| ENDURANCE | 4¼ Hours. | 5 Hours. |
| USEFUL LOAD | 4 Passengers.<br>(or 800-900 lbs. of Freight in 84½ cubic feet). | 8 Passengers.<br>(or 2,200 lbs. of Freight in 255¾ cubic feet). |

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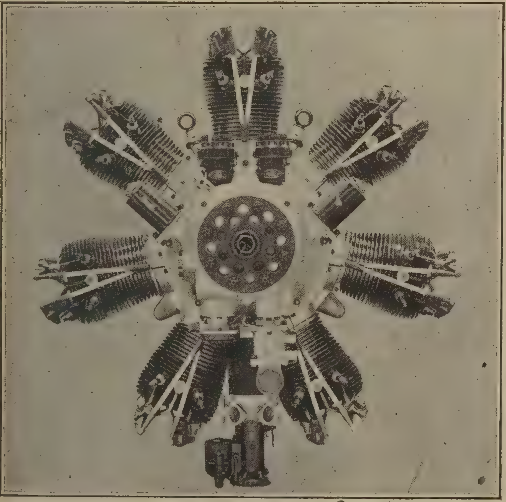
STAG LANE AERODROME, EDGWARE, MIDDLESEX.



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(*Continued from page 32.*)

**Civil Aeronautics at Home.**—On July 5th an air mail service began between London and Amsterdam. This was operated by H.P.T., Ltd., and the Dutch K.L.M.

On July 1st the Paris-Geneva air line was successfully inaugurated by the Swiss aviator, M. Durafour.

On and from July 2nd the air fee on letters to Paris was reduced to 2d. per oz.

On July 2nd a committee of the Port of London Authority visited Southampton to view a demonstration of the navigability of the Supermarine flying-boats, with a view to their use on the Thames.

On July 9th the first Aero Show to be held in England since 1914 began. It was fully described in THE AEROPLANE of July 14th and 21st. Capt. Sayers demonstrated in the issue of July 14th that, despite war extravagance, the cost of flying the machines exhibited in 1920 was precisely half that of flying the 1914 types. Fifteen firms showed twenty-seven machines, and there was a vast display of engines and accessories, which was made more valuable by many interesting exhibits by the technical departments of the R.A.F. The attendance of the public was very small.

On July 19th an air mail service began between London and Brussels. The fee was to be 2d. per oz.

On July 21st this paper introduced to the World the "Alula" wing—a new design of aerofoil which has more than fulfilled expectations up to the present.

On July 24th the "Aerial Derby" was flown from Hendon twice round London. The winner was Mr. F. T. Courtney, on a Martinsyde "Semiquaver," whose time was 1 hr. 18 m. 22 sec., his speed being 153.45 m.p.h. Mr. J. H. James, on a British Nieuport, was second. The handicap was won by Capt. H. A. Hamersley, on a Baby Avro, in 2 hr. 32 min. 6 sec. at a speed of 78.89 m.p.h. Mr. Bert Hinkler, on a similar machine, was second in 2 hr. 45 min. 46 sec.

On July 29th A. V. Roe and Co., Ltd., secured an interim injunction restraining the Aircraft Disposal Co from selling as Avros any machines not of the firm's manufacture.

**British Dominions Overseas.**—It was recorded on July 14th that Handley Page Indo-Burmese Transport, Ltd., had been floated in India on June 19th with a capital of 1,449,850 shares of 10 rupees each and 1,500 founders' shares of 1 rupee each.

Also on July 14th it was recorded that in June Rhodesia (outside Bulawayo) had its first experience of "joy-rides."

At the first regular meeting of the Hong Kong Aero Club on July 9th officers were elected and an ambitious programme accepted.

**Foreign Aeronautics.**—It was reported on July 7th that three Savoia flying-boats had arrived at Stockholm on June 16th, having flown thither from Italy *via* the Swiss Lakes and the Rhine.

On July 4th began the Italian competition for aeroplanes not exceeding 6 metres in span. On final results the Macchi 16 with 30-h.p. Anzani engine made the best showing.

On July 16th four U.S. Army de Havilland biplanes left New York for Nome, Alaska, *via* Canada.

From July 17th to 29th a sort of seaplane meeting took place at Antwerp, where the Olympic Games were held. A Vickers "Viking" amphibian and an "F.3" flying-boat belonging to the Aircraft Disposal Co. divided the honours.

On July 20th, at Stockholm, Major Orde Lees, late R.A.F., made his fiftieth parachute descent from an aeroplane. The machine was piloted by Capt. Saunders, of the P.O. Flygkompani. Major Orde Lees fell into the sea in a gale and was towed into the harbour at a rate of knots by the parachute and berthed himself satisfactorily at the steamer jetty.

On July 23rd a Bristol Fighter was presented to the King of the Belgians by the Aircraft Disposal Co.

## AUGUST.

**The Military Forces of the Crown.**—On Aug. 5th the list of successful candidates for Cadetships at Cranwell was issued, as the result of the examination held in June.

On Aug. 19th the Air Ministry made the first official announcement concerning the Wakefield Scholarships at Cranwell for sons of impoverished parents. The competition for the first was ordered to take place at the November examination in 1920.

**Civil Aeronautics at Home.**—The Air Ministry Competition for Large and Small aeroplanes began officially on Aug. 3rd at the R.A.F. Aeroplane Experimental Station at Martlesham Heath. Handley Page, Ltd., Vickers Ltd., and the Central Aircraft Co., Ltd., sent machines for the Large class. The Austin Co., Beardmore and Co., Ltd., the Bristol Aeroplane Co., Ltd., the Westland Aircraft Works, A. V. Roe & Co., and the Sopwith Aviation and Engineering Co., Ltd., sent machines for the small class.

The "Alula" wing was fully described by Capt. W. H. Sayers in this paper on Aug. 4th.

On Aug. 19th, the Air Ministry issued an important "Notice to Airmen" (No. 88) notifying innovations in meteorological signals to pilots on the regular air routes.

On Aug. 26th Aircraft Transport and Travel, Ltd., celebrated the anniversary of its foundation, the personnel little thinking that before the end of the year the line would have shut down and its employees would be among the unemployed.

On Aug. 26th Capt. Euan Dickson, on an Avro, flew from Sockburn (Canterbury, N.Z.) to Trentham (Wellington, N.Z.), this being the first flight across Cook Strait, between the North and South Islands. The return trip was made on Aug. 28th. His times were 4 hrs. 40 mins. out and 4 hrs. 9 mins. home. He carried two passengers.

About this time Capt. T. M. Wilkes, M.C., was appointed Secretary to the New Zealand Air Board.

On Aug. 31st, Mrs. Gretchen Menken (an American, though not obviously so) was fined £50 for smuggling fire-arms (nine revolvers) by air at Croydon Aerodrome.

**British Dominions Overseas.**—On Aug. 2nd Messrs Parer and Macintosh, who had left London on Jan. 8th, arrived at Port Darwin, Australia, on their D.H.9, with Siddeley "Puma" engine. They thus completed what is perhaps the greatest voyage in the history of Aviation. They did the journey entirely at their own expense, except for such help as they picked up on the way. The Commonwealth Government awarded them £500 each for their enterprise on their arrival at Melbourne. They were each awarded the Air Force Cross by the King.

The first flight between Auckland and Wellington, New Zealand, was accomplished on Aug. 19th, by Capt. R. Russell, D.F.C., on a D.H.6.

The constitution of the New Zealand Air Board was published in this paper on Aug. 25th. It was made known officially in New Zealand on June 24th.

**Foreign Aeronautics.**—Much important information concerning flying in Sweden was published on Aug. 11th.

On Aug. 9th, the famous German pilot, von Lössl, was killed while taking part in a gliding competition for engineless aeroplanes in the Rhön mountains.

On Aug. 9th a meeting of the Fédération Aéronautique Internationale was begun at Geneva. Various records were homologated.

The new numbering and location of the French aviation regiments was recorded on Aug. 18th.

On Aug. 21st the Zeppelin L61 was surrendered to Italy.

On Aug. 23rd, Clifford Prodger, a pioneer of American aviation, who had trained many aviators and had tested many aeroplanes for the British Flying Services, was killed in an aeroplane accident at Redwood, California.

On Aug. 24th all four D.H.4s. which left New York on July 15th arrived at Nome, Alaska, having travelled *via* Erie, Grand Rapids, Winona, Fargo, Portal (N.D.), Sakatoon, Edmonton, Prince George, Hazelton (Canada), Wrangell (Alaska), White Horse (Yukon), Dawson, Fairbanks, and Ruby to Nome, a distance of 4,345 miles, a remarkably fine performance. They all returned safely to New York.

## SEPTEMBER.

**The Military Forces of the Crown.**—The appointment of Dr. O. S. Sinnatt, M.C., D.Sc., M.Sc., to the Professorship of Aeronautical Science at Cranwell was announced on Sept. 21st. He had previously been Lecturer in Mechanical Engineering at King's College, London.

**Civil Aeronautics at Home.**—On Sept. 1st the Air Ministry Competition for Amphibian Aeroplanes began officially. The only machines to appear were the Vickers "Viking" flying-boat, the Supermarine flying-boat, and a Fairey float machine.

On Sept. 11th it was announced that the Sopwith Aviation and Engineering Co., Ltd., had closed down and gone into voluntary liquidation. This was the second big blow to British Aviation, the Aircraft Manufacturing Co.'s closing being the first.

A new air line, entitled the Air Post of Banks, was inaugurated on Sept. 13th. Westland Limousines were used, and the line ran with great regularity till December.

On Sept. 25th an accident occurred at Northolt to a twin-engined biplane belonging to and built by the Central Aircraft Co. In this accident Mr. Castleman, the pilot, Miss Imelda Trafford, who was a certificated aviatress, and three other passengers, were killed.

**British Dominions Overseas.**—The specifications for "Exploratory and Forest Patrol Aircraft" to be bought by the Canadian Air Board were published on Sept. 29th.

**Foreign Aeronautics.**—On Sept. 8th this paper published the constitution of the General Staff of the French Service d'Aviation.

On Sept. 8th a daily trans-continental mail service was begun between New York and San Francisco. The first machine, a D.H.4, piloted by Mr. Randolph Page, carried 16,000 letters, weighing in all 400 lbs. The mail time is to be reduced from 91 hours to 54 hours.

On Sept. 8th, 9th, and 10th a conference of the Fédération Aéronautique Internationale was held at Geneva.

On Sept. 15th it was announced that the French Post Office had come into line with the British, and had reduced the Air Mail fee from 3 francs to 75 centimes.

On Sept. 15 an Anglo-Scandinavian air mail service began, from Stockholm, *via* Malmo, Copenhagen, Hamburg and Amsterdam. It was discontinued after a few weeks, owing to the closing of the Amsterdam-London Section. Meantime the Germans continued their air lines.

The Schneider Cup Race, for seaplanes, was flown at Venice on Sept. 21st. Lieut. Luigi Bologna flew over the course on a Savoia 12 (450-h.p Ansaldo engine), all foreign competitors having failed to appear, and the other two Italians failing to start.

On Sept. 21st Brig.-Gen. Guy Livingston, representing Handley Page, Ltd. (and the Aircraft Disposal Co., Ltd.), was received by the President of the Argentine Republic.

On Sept. 22nd it was recorded that the "Soviet" workmen who had possessed themselves of many great Italian factories were, of their own accord, tuning up the Italian machines for the Schneider Cup race.

The last Gordon Bennett Cup Race was held at Etampes on Sept. 28th, the victory of M. Sadi Lecointe making the Cup the property of the Aero Club de France. M. Sadi Lecointe's Nieuport was the only machine to finish the course without alighting. One other French machine, the two Americans, and the one British competitor failed to complete the course. M. le Comte de Romanet, on a Spad, covered the distance, but was compelled to alight *en route.*

An article published in this paper on Sept 29th, on "Who's Who in America," exposed the doings of Mr. Enrico Casalagno (*alias* Woodhouse) and won considerable approbation in the United States. This Woodhouse had tried to manœuvre the Aero Club of America into fulfilling his wishes as to International Aviation and had done much dis-service to flying.

In the same issue the constitution of the Belgian "Syndicat National pour l'Etude des Transports Aériens," commonly known as the S.N.E.T.A., or Sneta, was explained. This Syndicate has done much good work.

## OCTOBER.

**The Military Forces of the Crown.**—The new constitution of the Air Council was published in the *Gazette* of Oct. 10th. It now consists of the following members:—One of His Majesty's principal Secretaries of State (president); the Parliamentary Under-Secretary of State for Air; the Chief of the Air Staff; the Controller-General of Civil Aviation; the Director-General of Supply and Research; the Secretary of the Air Ministry. These are to-day, in the above order: Mr. Winston Churchill; the Marquess of Londonderry; Air-Marshal Sir Hugh Trenchard, Bart.; Maj.-Gen. Sir Frederick Sykes; Air Vice-Marshal Sir E. L. Ellington; and Mr. MacAnally.

**Civil Aeronautics at Home.**—The awards in the Air Ministry Competition at Martlesham were announced on Oct. 2nd. In the "Large Class" the first prize was not awarded. The second prize of £8,000 was given to Handley Page Transport, Ltd., for the "W.8" (two Napier engines), and the third of £4,000 to the Vickers "Vimy" (two Rolls-Royce engines). In the "Small Class" the prizes were: First, Westland (450-h.p. Napier engine), £7,500; second, Sopwith (180-h.p. Wolseley-Hispano "Viper" engine), £3,000; and third, Austin "Kestrel" (160-h.p. Beardmore engine), £1,500.

The formation of the de Havilland Aircraft Co., by Capt. Geoffrey de Havilland (of Airco fame), Mr. C. C. Walker and Mr. A. E. Turner, was recorded on Oct. 6th. It was the first sign of a resurrection of the Aircraft Industry.

The first post-bellum British airship, the "R.80," built by Vickers Ltd. was described in this paper on Oct. 6th.

The awards in the Amphibian Competition were announced on Oct. 11th, thus:—First, Vickers "Viking III" (Napier engine), £10,000; second, Supermarine flying-boat (Rolls-Royce), £8,000; and third, Fairey float biplane (Napier engine), £2,000.

On Oct. 11th was concluded the longest *bona fide* commercial flight on record. Mr. R. Wright, of Nasmyth, Wilson and Co., left Cricklewood on a D.H.9, piloted by Mr. Perry, on Sept. 12th, flew *via* Vienna and Belgrade to Bukharest and Jassy in Rumania. He left Bukharest on Oct 9th, Vienna on Oct. 10th, and Strasburg on Oct. 11th, doing the last stretch of 420 miles non-stop in 3 hr. 55 min.

The First Air Conference to be held in London began on Oct. 12th with a paper read by Sir Fredk. Sykes. At the inaugural lunch Mr. Churchill said that this time had been fixed because Parliament was not sitting and there would be more room in the papers to give attention to it. In other words, the Air Conference was a good "Silly Season" topic. The Conference lasted three days and included an enjoyable visit to Croydon Aerodrome at the nation's expense. Other papers were read by Mr. White Smith, Sir E. Ellington, Capt. F. S. Barnwell, Sir Trevor Dawson, and Sir Hugh Trenchard. The last mentioned was of great importance, as it contained much information as to the future of the R.A.F.

It was made known on Oct. 13th that Brig.-Gen. F. L. Festing, C.B., C.M.G.—formerly in charge of personnel, R.F.C. and R.A.F., in France, and later Director of A.T. and T., Ltd.—had been appointed in charge of aerodromes and licensing in the Department of Civil Aviation

A full explanation of the operation, in theory and practice, of the Handley Page wing (by Capt. W. H. Sayers) was published on Oct. 27th, together with photographs of the first machine to fly with it at the demonstration on Oct. 21st.

**British Dominions Overseas.**—The official report of the Canadian Air Board on the work done in Canada during 1919-1920 was published on Oct. 13th, and demonstrated that very great progress is being made by the able officials who control aviation in the Dominion.

On Oct. 7th a Fairey seaplane, piloted by Lieut.-Col. R. Leckie, left Halifax on the first stage of a flight from the Atlantic to the Pacific. The crew and dispatches were transferred to an H.S.2.L at Long Reach, and to an F.3 at Rivère du Loup. At Winnipeg the dispatches were transferred to a D.H.9a piloted by Capt. C. W. Thompson, who, after stops at Calgary, Revelstoke, Merritt, B.C., and Agassiz, arrived at Vancouver on Oct 14th.

On Oct. 18th Mr. N. B. Love, of the Australian Aircraft and Engineering Co., Ltd., arrived at Sydney, thus completing on his Avro a 5,000-mile business trip for Lewis Berger and Sons, Ltd., begun on Sept. 7th.

A most illuminating and important paper on Aircraft Depreciation and Costs, issued by the Canadian Air Board, was published on Oct. 20th, and drew considerable attention.

The constitution of the South African Air Board was issued in Pretoria on Oct. 27th.

On Oct. 29th the S.S. *Alconda* left London for Newfoundland carrying an S.S. Twin and three Blimp airships to be used as scouts in seal-hunting and whaling.

**Foreign Aeronautics.**—The machines used in the German gliding and soaring competition held in the Rhön hills during July and August were described and illustrated in this paper on Oct 6th.

On Oct. 10th there was a great aviation meeting at Buc, near Versailles, at which vast crowds were present. A race was held for commercial machines from Buc to Croydon and back. Owing to fog, only two machines completed the course, a Spad and an S.E.A.

On Oct. 21st M. Sadi Lecointe, on his Nieuport, put up a speed of 302.525 km. per hr. (189 m.p.h.), officially timed at Villacoublay.

## NOVEMBER.

**The Military Forces of the Crown.**—On Nov. 4th Flying Officers Prout and Fenwick were killed near the notoriously dangerous aerodrome at Kenley through arriving in a fog.

On Nov. 11th, Armistice Day, at the Burial of the Unknown Soldier at Westminster Abbey, the R.A.F. was represented by Air Marshal Sir Hugh Trenchard, who was one of the pall-bearers. Capt. H.R.H. the Duke of York wore R.A.F. uniform. An airman of the R.A.F. formed one of the guard of honour round the grave, and 31 officers and 60 other ranks of the R.A.F. took part in the procession.

On Nov. 22nd the Air Ministry issued Regulations extending the right of entry for Short Service commissions to civilians entering direct from civil life.

On Nov. 26th Mr. Churchill stated that at Oct. 1st the strength of the R.A.F. was 2,812 officers and 23,862 men. The number authorised for 1920-21 was 3,059 officers and 26,519 men.

**Civil Aeronautics at Home.**—On Nov. 2nd the Air Post of Banks (still in process of formation as a limited company) suspended operations. It is still suspended.

On Nov. 2nd the Court confirmed the appointment of Mr. D. S. Fripp as receiver and manager of Martinsyde, Ltd., on behalf of the debenture-holders. This historic firm was thus saved from going into liquidation for the benefit of the Excess Profits Duty collectors.

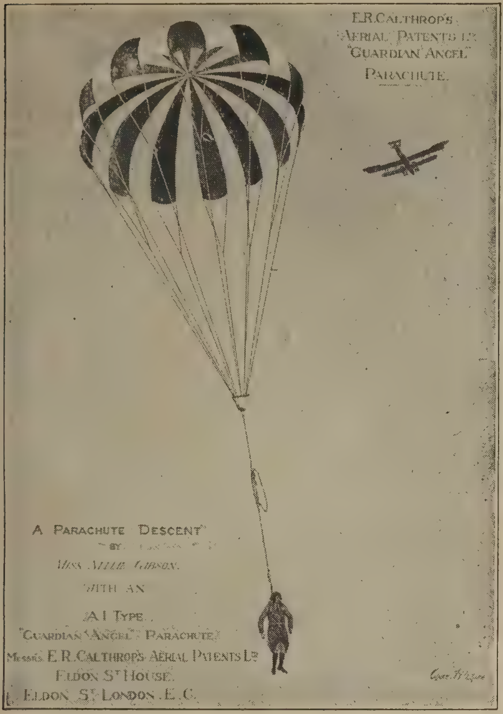
On Nov. 17th the Royal Aeronautical Society held its annual dinner, with Lord Weir, the President, in the chair.

On Nov. 18th M. Louis Damblanc submitted to a meeting of the Royal Aeronautical Society a paper on the Helicopter for which the French Government has granted him 300,000 francs subsidy. The paper was translated and read by Capt. W. H. Sayers, technical editor of The Aeroplane.

During the week-end Nov. 20-21, the Instone Air Line's "Vimy" took up 472 passengers at 5s. a head, 85 on Saturday and 387 (in 3½ hours) on Sunday. This appears to be a "joyride" record.

**British Dominions Overseas.**—On Nov. 3rd this paper published a most important article by Mr. Ellwood Wilson, Chief Forester of the Laurentide Co. of Quebec, on timber surveying by aeroplane. This was the first disclosure by a competent authority of the value of aircraft for such work.

On Nov. 22nd, Mr. T. Solomon, of Aviation, Ltd., Cape Town, piloting an Avro, with Mr. H. Goldstone and a Nor-



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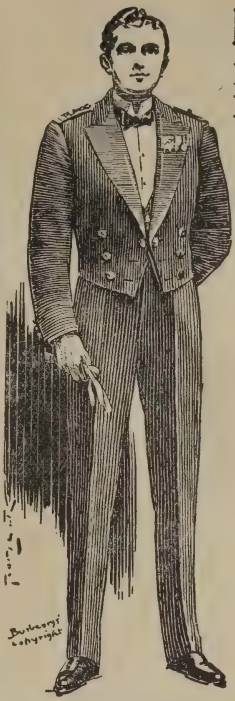

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STRENGTH CALCULATIONS.
GENERAL THEORY. By JOHN CASE, M.A., A.F R.Ae.S.
MATHEMATICS. By JOHN CASE, M.A, A.F.R.Ae.S.
HIGH TENSILE STEEL WIRES AND CABLES. By JOSEPH WILSON, Dr. R.A.F.
ALLOWANCES FOR BENDING STEEL. By RANDOLPH F. HALL.
THE VIBRATIONS METHOD OF TUNING UP By INGEGNERE CARLO MAURILIO LERICI.
AIRCRAFT TESTING.
WIRELESS TELEGRAPHY AS APPLIED TO AIRCRAFT. By R. D. BANGAY.
SPRAY PAINTING, VARNISHING, AND DOPING. By C. L. BURDICK.
DOPE. By A. J. A. WALLACE BARR.
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PERFORMANCE. By JOHN CASE, M.A, A.F.R.Ae S.
A NOTE ON STABILITY By Captain W. GORDON ASTON, A.F.R.Ae.S., A.M.I.A.E.
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wegian whaling captain as passengers, made the first serious attempt at spotting whales by aeroplane. A second attempt next day satisfied the whaler that aircraft are useful.

On November 30th, to inaugurate the control of Civil Aviation in Australia, Mr. Degaris, a Melbourne business man, started in a D.H.9 ("Puma" engine) from Melbourne to Perth, a distance of 2,169 miles, arriving on Dec. 2nd. The total flying time was 18 hrs. 12 mins.

**Foreign Aeronautics.**—Notes on flying in Iceland, by Mr. Frank Frederickson, late R.A.F., appeared on Nov. 3rd.

On Nov. 3rd Capt. the Count de Romanet, flying a Spad-Herbemont (300-h.p. Hispano), raised the Speed Record to 309 kms. per hr. (193 miles per hr.). In one turn over the kilometres course he reached 321 kms. (201 miles) per hour.

On Nov. 13th the Blériot works at Suresnes, employing 1,300 hands, were closed down owing to lack of business.

On Nov. 17th attention was drawn in this paper to the unintelligent manner in which the Inter-Allied Aeronautical Commission in Germany was breaking up German aeroplanes and depriving the world of the knowledge to be gained.

The first Central European Aero Show, that held at Prague (Czecho-Slovakia) from Oct. 23rd to Nov. 2nd, was described on Nov. 17th.

It was announced on Nov. 24th that the famous Curtiss Aeroplane and Motor Corporation had cut loose from the Willys-Overland control and had again become a free firm, with Mr. C. M. Keys as President.

On Nov. 25th the race for the Pulitzer Trophy was flown over a course on Long Island. The winner was Lieut. C. C. Mosley, on a Verville racer (550-h.p. Packard engine). His speed was about 190 miles per hr. The second was Capt. H. E. Hartney, Thomas-Morse (300-h.p. Hispano-Wright), and third Mr. A. Acosta, Ansaldo (220-h.p. S.P.A.).

### DECEMBER.

**The Military Forces of the Crown.**—On Dec. 8th Supplementary Estimates for the Air Ministry, amounting to £1,935,300 were issued. The White Paper showed that the Air Ministry had saved £2,050,800 of the £21,000,000 allocated to it, although it had raised five extra squadrons for which it had not budgetted. The deficit was caused by saddling on the Air Ministry debts of £3,255,200 incurred by the Ministry of Munitions. These estimates passed on Dec. 14th.

The results of the November examination for the Cadet College at Cranwell were announced on Dec. 24th. The first on the list, Mr. V. O. Gillmore, was over 1,000 marks ahead of the next competitor.

The true story of the Montrose Ghost, which exercised the minds of the R.F.C. in 1917 and after, was told for the first time in this paper on Dec. 29th.

It was announced on Dec. 29th that His Majesty the King had conferred the Distinguished Flying Cross on the King of the Belgians, who did much flying in the face of the enemy during the war. The Duke of York is to visit Belgium to present the Cross. In no case has it been better deserved.

Throughout 1920 the R.A.F. has been at war in Russia, Turkey (in Europe and Asia), Mesopotamia, Somaliland, Arabia, the Soudan, the Indian North-west Frontier, and in Ireland. Week by week official communiqués were published, but where all recorded so much gallantry and good work it would be invidious to select any for quotation. It must suffice to say that in all war areas the R.A.F. has maintained the highest traditions of the Army which gave it birth.

At home the R.A.F. has already lived down all reproaches which were made against it during the War and after the Armistice. The quality of its flying is as high as ever, and in all other respects it has far surpassed its earlier levels. The smartness of "other ranks," whether on pass or on parade, their keenness on ceremonial, and the superlative excellence of their march discipline, is at once evidence of the high quality and enthusiasm of the airmen and of the good feeling which they entertain towards their officers.

The R.A.F. is the last and least of the King's Armed Forces, but in no other respect does it now yield pride of place to the sister Services.

**Civil Aeronautics at Home.**—On Dec. 1st this paper published the first detailed description of a successful all-metal airscrew (the Leitner-Watts). Also on Dec. 1st, appeared a humorous letter by the late Mr. Robert Bager, describing how he found the London Terminal Aerodrome by "directional wireless."

On Dec. 4th, Mr. R. H. MacIntosh, of Handley Page Transport, Ltd., performed the extraordinary feat of flying across the Channel against a gale which prevented any of the cross-Channel steamers from crossing. He flew a D.H.9 ("Puma" engine), and carried two passengers. On the same day Mr. Vaughan Fowler, on a D.H.4 (Rolls-Royce engine), did the journey in the opposite direction, travelling from Cricklewood to Paris in 1 hr. 48 mins.

On Dec. 6th the *Daily Mail* stated that Aircraft Transport and Travel, Ltd., had ceased to operate its cross-Channel service. The announcement was premature, as the line ran till Dec. 15th, Mr. Robins bringing the last machine from Paris on that day. The line is now in the hands of a receiver, pending finding the capital necessary to revive it.

On Dec. 10th the Department of Civil Aviation issued its report for the half-year April 1st to Sept. 30th. This showed only 129 Renewals of Civilian Pilots' licences, and 90 renewals of Ground Engineers' Licences. But it showed 8,200 hours flown, against 6,566 of May-Sept., 1919, and a total machine mileage of 921,200 miles (or 1,500,000 kilometres without subsidies, against 1,000,000 kilometres in France with subsidies). The value of goods imported was £376,606, and of goods exported £168,300.

On Dec. 14th, an 0/400 Handley Page, G-EAMA, leaving Cricklewood for Paris, hit a tree and fell against a house near Golders' Green, where it took fire. The pilot, Mr. Bager, his assistant Mr. Williams, and two passengers, were burned to death. Three other passengers escaped.

**British Dominions Overseas.**—On Dec. 15th Mr. Hector Sleeman, of Aerial Transport, Ltd. (Australia), read before the Institution of Aeronautical Engineers in London a paper on the possibilities of aviation in Australia, which paper should be of high value to those concerned.

An account of Capt. R. S. Carroll's pioneer work with a Nieuport "Nighthawk" in Malaya appeared on Dec. 22nd.

It was made known in December that Colonel Brinsmead, late Australian F.C., had been appointed Controller of Civil Aviation in Australia.

**Foreign Aeronautics.**—On Dec. 12th, at Villacoublay, M. Sadi Lecointe, on a Nieuport (300-h.p. Hispano), raised the Speed Record to 313 kms. (194 miles) per hour.

On Dec. 2nd the French *Journal Officiel* published a lengthy list of aviators and others concerned with aviation who had been promoted in or nominated to the Legion of Honour. In this country nobody received rank or title for services to aviation during 1920.

On Dec. 7th the Wright Aeronautical Corporation obtained a preliminary injunction against Handley Page, Ltd. and the Aircraft Disposal Co., Ltd., to prevent them from selling aeroplanes in the United States.

On Dec. 15th this paper published photographs and a full description of the four-engined Zeppelin-Staaken giant monoplane about which the daily Press had published so much inaccurate information. In the same issue the 16-h.p. de Pischof "avionette," the smallest practical aeroplane was described and illustrated. Also the Stout "Bat-Wing" monoplane, made in the U.S.A.

On Dec. 22nd, that excellent German paper, *Flugsport*, published the specifications of the Kattler-Lachmann wing, invented in February, 1918, and strongly resembling the Handley Page Wing. The German Patent Office is still considering whether it is practicable and therefore patentable.

The variable surface wing produced by MM. Gastambide and Levavasseur, two of the pioneers of aviation, was fully described in this paper on Dec. 29th.

## AN OFFICIAL REPORT.

On Jan. 10th the Air Ministry issued Communiqué No. 636, which is a report of the Air Ministry Competitions of 1920. The report is too long to be included in this issue of THE AEROPLANE, and, in any case, it pertains to the Technical Section, which is already in print. Capt. W. H. Sayers will deal with it in "Aeronautical Engineering" next week.

## AIR POST OF BANKS (IN SUSPENSE).

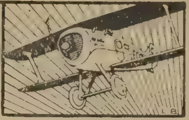
Apropos the paragraph concerning the meeting of creditors of Mr. C. J. H. Mackenzie-Kennedy which appeared in last week's AEROPLANE, Mr. Kennedy desires it to be known that he did not share with Mr. Humphrey, of Dawsons, of Newcastle-on-Tyne, in the building of the large aeroplane which that firm was building at the time of its dissolution. Mr. Kennedy states that Mr. Humphrey himself undertook to build the machine at his own expense, and that Mr. Kennedy was to be remunerated by him for the designs. The result is that Mr. Kennedy is at the present moment a creditor of Mr. Humphrey for a very large amount.

Mr. Kennedy further states that the Air Post of Banks service has only been temporarily suspended pending reorganisation of the business and readjustment of his affairs.

He also desires it to be known that the meeting of his creditors, which was held on Dec. 31st, was adjourned until the end of this month to allow him to bring in a scheme which he is proposing to do.

One hazards no opinion as to whether the designs of the aforementioned big machine were value for "a very large amount," nor does one know whether Air Post of Banks is likely to be reorganised. One merely repeats Mr. Kennedy's statements as requested by him.

# COMMERCIAL AERONAUTICS
## AND CIVIL AERIAL TRANSPORT.



## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M): next the number of passengers: and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G.E.A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

JANUARY 3rd:

M.A., Spad, F-CMAY, London-Paris, 10.28-12.20, G., Nil, Le Sec.
I.A.L., "Vimy," G-EASI, London-Paris, 12.15-14.50, G., 5, Barnard & 1.
M.A., Breguet, F-CMAG, London-Paris, 12.35-14.55, G.&M., Nil, Martel.
G.E.A., "Goliath," F-GEAC, Paris-London, 12.00-15.03, G., Nil, Labouchere & 1.
M.A., Breguet, F-CMAI, Paris-London, 12 55-15.04, G.&M., 2, Challoux.
S.N.E.T.A., DH9, O-BEAU, Brussels-London, —15.04. G., Nil, Delzenne.
S.N.E.T.A., DH4, O-BALO, Brussels-London, —15.10, G.&M., Nil, Rigault.

JANUARY 4th:

S.N.E.T.A, DH4, O-BALO, London-Brussels, 13.25-15.35, Nil, Nil, Rigault.
I.A.L., "Vimy," G-EASI, Paris-London, 13.20-16.00, G.&M., 1, Barnard & 1.

JANUARY 5th:

M.A., Breguet, F-CMAD, Paris-London, 12.45, St. Inglevert, G.&M., Nil.

JANUARY 6th:

G.E.A, "Goliath," F-GEAC, London-Paris, 11.20-14.15, G., Nil, Labouchere & 1.
M.A., Spad, F-CMAY, Paris-London, 12.55-15.10, G.&M., Nil, Le Sec.
S.N.E.T.A., DH4, O-BABI, Brussels-London, —15.10, G.&M., Nil, Briere

JANUARY 7th:

NIL.

JANUARY 8th:

M.A., Breguet, F-CMAI, London-Paris, 11.20-14.05, G., Nil, Challoux.
M.A., Spad, F-CMAY, London-Paris, 12.35—, Nil, 1, Le Sec.
S.N.E.T.A, DH4, O-BABI, London-Brussels 13.45-15.45, G.&M., Nil, Briere.
S.N.E.T.A., DH4, O-BADO, Brussels-London, —12.55, G. & M., Nil, Van Opstal.

JANUARY 9th:

NIL.

### The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

JANUARY 3rd:

NIL.

JANUARY 4th:

NIL.

JANUARY 5th:

H.P.T., DH9, G-EAUC, Brussels-London, 12.50, landed Lympne 15.40, G.&M., Nil, ——

JANUARY 6th:

NIL.

JANUARY 7th:

H.P.T., HP, G-EATN, Paris-London, 12.25, landed Lympne 15.40, G.&M., 1, ——
S.N.E.T.A., DH4, O-BADO, Brussels-London, 12.28, landed St. Inglevert. 14.30, G.&M., Nil, ——

JANUARY 8th:

H.P.T., H.P., G-EATK, London-Paris, 11.58-15.20, G.&M., 6, ——

JANUARY 9th:

NIL.

### The London Terminal Aerodrome.

On Tuesday of last week the Instone "Vimy" arrived from Paris. On Wednesday Mr. Barnard took the machine up for an engine test with Mr. Lappin, representing Rolls-Royce, Ltd., and three passengers. For the space of a quarter of an hour he indulged in some of the finest flying with a big machine that one has ever seen.

Starting from the hedge at the far side of the aerodrome he held her just off the ground until the level-crossing was reached, when he put her into a sixty-degree bank and climbed her thus in a spiral to about 2,000 ft., the first 1,000 ft. being reached in the course of 1½ turns. It was quite a perfect spiral as one could see a haystack down below and the machine was keeping the wing tip right on this.

After this he proceeded to nose dive, stall, sideslip, and then fly first on one engine alone and then on the other; in fact, he flew her as a pusher, a tractor, and a "sidewayser."

On Saturday, when some obsolete rockets were being fired off as a demonstration for test, a French Bréguet pilot was just starting off to Paris. He at once landed on seeing the signal and was very wrath, but one would suggest that he should learn the international signals, for it was only the "carry-on" signal which was fired.

During the day the Instone "Vimy" was giving pleasure flights, and the Leatherhead "six" was giving joy-rides.

On Sunday the same two machines were again performing with the addition of Mr. Chapman's Avro, which also joined the fray and executed some capital stunts with passengers, returning to Leatherhead in the evening.—C. D.

### A Mystery Solved.

An inquest was held on Dec. 30th on John Lawrence Hall, who resided at the Imperial Hotel, Russell Square, and was found dead on Christmas evening. Mrs. Alice Hall, of The Oaklands, Collegiate Crescent, Sheffield, said that her son had been addicted to drug-taking for the last four years. Also, she said that since the Government started their aviation school at Hendon four years ago her son had been without work, but that he had small private means and had a large amount of money when he died. The inquest was adjourned.

John L. Hall will be remembered as running an aviation school at Hendon in the early days of the war. A certain number of pupils were trained there, but the school was not well run and no harm was done by closing it. J. L. Hall himself at one time gave promise of being quite a good pilot, but towards the end of his career displayed a marked dislike for flying. It was never quite clear whether he took to drugs because he lost his nerve or whether he lost his nerve because he took to drugs.

After closing his school he disappeared entirely from his usual haunts, and at one time there were paragraphs in the papers under the heading of "Missing Airman," which apparently referred to him. He was 29 years of age, but did no military service.

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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... ... *Front Cover & Back Cover*
Armstrong Siddeley Motors, Ltd. ... ... 45
Arrol-Johnston, Ltd. ... ... ... *Front Cover*
Auster, Ltd. ... ... ... ... ... *Front Cover*
Beardmore Aero Engines, Ltd., The *Front Cover*
Bowden Brake Co., Ltd., The ... ... ... 52
Bristol Aeroplane Co., Ltd. ... ... ... 46
British Thomson-Houston Co., Ltd., The ... 41
Burberrys ... ... ... ... ... ... 49
Calthrop, E. R., Aerial Pat., Ltd. ... ... 49
Cellon, Ltd. ... ... ... ... ... ... 46
Coan, R. W. ... ... ... ... ... ... 46
Cunard Line ... ... ... ... ... ... 52
Davis Furnace Co., The ... ... ... ... 46
De Havilland Aircraft Co., Ltd., The... ... 45
Fairey Aviation Co., Ltd., The ... ... ... 33
Handley Page, Ltd. ... ... ... ... 29
Kodak, Ltd. ... ... ... ... ... ... 41
Martinsyde, Ltd. ... ... ... ... ... 34
Metal Airscrew Co., Ltd.... ... ... *Front Cover*
McGregor, Gow, & Holland, Ltd. ... ... 51
Napier, D., & Son, Ltd. ... ... ... ... 37
New Pegamoid, Ltd. ... ... ... 52
Nieuport and General Aircraft Co., Ltd. ... 29
Palmer Tyre, Ltd. ... ... ... ... ... 39
Roe, A. V., & Co., Ltd. ... ... ... ... 30
Short Bros., Ltd. ... ... ... ... *Back Cover*
Titanine, Ltd. *Front Cover & Inside Back Cover*
Vickers, Ltd.... ... ... ... ... ... 43
Westland Aircraft Works... ...*Inside Front Cover*

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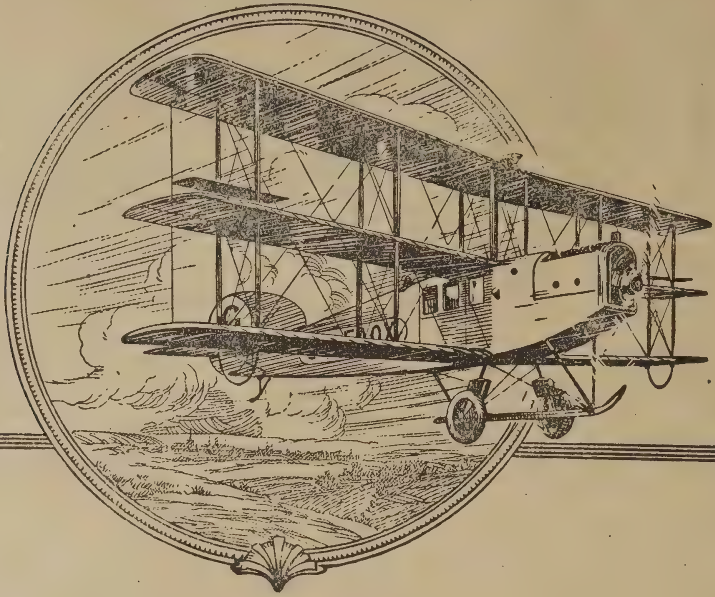

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## ON THE NEXT AIR CONFERENCE.

There is no doubt that the Air Conference in October last did a certain amount of good. In fact, for a first attempt it was not at all a bad effort, considering that before it took place nobody except the promoters of the Conference quite understood what it was all about and what were its aims and objects. It was only when Mr. Churchill announced at the inaugural lunch that it was a species of Air Parliament that people quite grasped the idea.

It will be remembered that Mr. Churchill stated also that the date had been fixed for a time when the Parliament at Westminster was not sitting so that there might be more room in the newspapers to report the proceedings of the Air Parliament. The fixing of the date for this period naturally reduced the status of the Conference to that of a "Silly Season" topic, along with sea-serpents and big gooseberries. But, be it recorded to the credit of the proprietors of the daily news-sheets, considerably more space was given to the proceedings of the Air Conference than is usually given to those of the talking-shop at Westminster, and the sea-serpent and the big gooseberry were altogether crowded out to make room for talk about the air. Therefore, on the whole, aeronautical affairs received quite a good advertisement, though unhappily that advertisement did nothing to prevent the sudden and complete collapse of Civil Aviation when the general financial slump came at the end of last year.

To-day the questions arise as to whether and, if so, when another Air Conference shall take place, and the lines on which such a Conference shall be run. These questions are well worth the consideration of everybody concerned with aeronautical affairs, and if any readers of this paper have any views on the subject one will be glad to hear from them, for anything which will help towards the success of the Conference will naturally help Aviation.

### When?

It may, one believes, be taken for granted that there will be another Conference. Mr. Churchill made it quite clear that it was the official intention to hold an Air Conference annually. Therefore the first important question is when the 1921 Conference shall take place.

Personally, one is firmly convinced that the date should be in March, preferably not later than the second week in the month. Any time in April would be rather late, but, if it is impossible to hold the Conference earlier, April would be better than any time later in the year.

Apparently the objection to the middle of March is that those estimable gentlemen who would be so kind as to read papers at the Conference would not have time to prepare their material and deliver their manuscript (or typescript) to the Air Ministry long enough before that date for their papers to be printed. This seems to be an objection which can be easily overcome if the organisers of the Conference set to work at once.

If the writers of the papers take the matter seriously each of them can do his job inside of a week. Any first-class printer would set the whole lot of papers in three days. So that, allowing another week for proof-reading, correcting, and printing, there is no reason whatever why all this should not be done by the end of February.

It may be argued that a week does not allow enough time to compose and put on paper such monumental works as the lectures which were given at the last Conference. To this one replies that the longer it takes to compose an article or lecture the worse is the result. Work of this kind is always best when done under pressure.

Another answer is that at the next Conference there is no need for such elaborate papers, and so less time will be needed for their composition. This point, however, belongs to a later section of this article—namely, that dealing with the lines on which the Conference shall be run, or, as one may put it, the question of whether the gathering shall be a Parliament or a series of Lectures. The present point at issue is the date.

### Why March?

The particular reason for advocating so strongly the month of March as the date for the Conference is that Civil Aviation needs a proper official start, or a jumping-off place, or a kick-off, whichever you like to call it. Before the war we had our Aero Shows in March, and they provided just the right sort of kick-off. [NOTE.—A kick-off must not be confused with a kick-out, though just at this present moment the terms might be regarded as synonymous so far as aviation is concerned.]

Now this year there are not going to be any Aero Shows. Both France and America have decided not to hold shows in 1921, and so has the British Aircraft Industry. It will not be surprising if the German Industry holds a show at the end of the year, for the Germans have both enterprise and industry to a degree which appears to be unattainable farther West. But if a German Aero Show is held it will be for the benefit of their trade in 1922. And what we want is a good start for the Spring and Summer of 1921.

By March those few of the faithful who are now hoping to organise air transport ventures with the Government's paltry £60,000 subsidy as a bait for the wily capitalist will have their schemes in some sort of shape. They will thus be able to voice their opinions at the Conference, and may be able to extract from the Government's representatives some pronouncement as to official intentions in the future.

If these intentions are honourable, that is to say, if the Government intends to wed the Department of Civil Aviation to the Air Transport Industry, and does not merely intend to seduce that industry into wasting its substance, then there will be nine months of the year left in which to bring Civil Aerial Transport to fruition. If, on the other hand, Officialdom shirks its duty to the State, then the parents of the Air Transport Industry, who are the Aircraft Manufacturing Industry and the coy Capitalist, can put an end to any alliance with Officialdom and send their erring offspring abroad to develop her career in the British Dominions Overseas, where—in Canada particularly—she may find a kindlier mate.

### The Evils of Delay.

The main point is that if the Conference is held later than March, or than April at the very latest, the resultant publicity, and any really sound arguments which are put forward of a truly constructive nature, will be too late to be of any use to aeronautical progress in 1921. In April and May our air line traffic should be developing nicely, and by June it should be in full blast, and then people will be too busy to be bothered with Conferences. Therefore we want any good which may result from the Conference, and any influence which it may have on the public mind, to take effect while this development is in progress.

If it cannot be held in March or early in April then it will be better to postpone the Conference till November or December, when it will be possible to review the doings of 1921, and resolve to do better in 1922. But what we want far more than anything else for British Aviation is a good kick-off for air traffic in 1921. And that can only be done by holding the Conference in March or April. But the middle of March for preference.

### Witenagemot or Chautauqua?

In the United States they have an institution called the Chautauqua Lecture. One does not pretend to a knowledge of the origin of that alluring title, though one has a hazy idea that Chautauqua is not, as might be imagined, the name of a patent medicine or of a quack doctor, but is a holiday resort frequented by the earnest-minded *bourgeoisie*, where, by way of combining the benefits of an open-air holiday with mental self-improvement, arrangements were made in the long ago by a local Society for the delivery by eminent people of lectures of the most devastatingly improving kind. Apparently these lectures, once delivered only at

Chautauqua itself, are now delivered at a number of places in succession, so that to-day there is a regular circuit of Chautauqua Lectures which pursue their dire career over the length and breadth of the United States with a terrific effect on the innocent and happy ignorance of the people comparable only with the effect of the Assize of the late Judge Jeffreys on the followers of the lamented Duke of Monmouth in Somerset and Devon.

Now the question arises whether the next Air Conference is to consist of a series of Chautauqua Lectures, delivered by people eminent in the aeronautical community to audiences of selected victims compelled to come in from the highways and by-ways by the minions of the Department of Information, Air Ministry, Kingsway, W.C.2, whether they are athirst for aeronautical information or not: or whether the Conference shall be, as Mr. Churchill called it, an Air Parliament, at each sitting of which somebody of some importance will propose a motion supported by a short argumentative address to be followed by a free debate on the motion and a subsequent vote.

Seeing that such an assembly could not have any executive power, such as is associated with a Parliament as we now understand it, the gathering would in the second case partake rather of the nature of a Saxon Witenagemot.

The point is that the whole organisation of the Conference will have to be completely different according to whether the Air Council decides for a Chautauqua or a Witenagemot. For, be it noted, the last Conference was neither one nor the other, which largely accounted for an impenitent's remark that the Guildhall was one of the most comfortable places in which he had ever slept.

### The Chautauqua Scheme.

If the Air Council decides on a Chautauqua, then the people who are already on the inside of aviation may as well stay away, except those who are roped in to take part in the organised debates after the lectures, or who like to be seen there as being "in the movement." The Aircraft Industry will be better occupied in its offices trying to make money than in the Guildhall listening to lectures which should rightly be delivered to the Royal Aeronautical Society or to the Institution of Aeronautical Engineers. Still, if properly organised the Chautauqua system may be beneficial to Aviation, provided that the desired audiences can be persuaded to attend.

For example, if somebody with experience of Civil Aerial Transport gave a lecture on that subject, the audience should consist of the proprietors and/or editors of trade and technical newspapers, the moving spirits of employers' federations of trades which would benefit by air transport, the leaders of the Trade Unions concerned with those trades, and so forth. And the heads of shipping firms, railway companies, big export houses, and such business people should be particularly invited.

A lecture on Aircraft Construction should be attended by representatives of engineering societies of all kinds concerned with constructional engineering. And special invitations should be sent to the heads of constructional engineering firms, motor manufacturers, ship-building firms, and others who must sooner or later be interested in the construction of aircraft.

A lecture on Aircraft Design should have an audience brought in from the more scientific side of those associations and businesses who would also be interested in the construction of aircraft.

A lecture on the Royal Air Force should have a special audience produced by inviting the heads of our public schools (both major and minor), our Universities (ancient and modern), and our Army cramming establishments, so that these people, ever the most conservative, might be convinced that the R.A.F. offers a career worthy of the pick of our modern youth. And it would be well if those responsible for primary and secondary education all over the country could also be induced to attend, so that they might be told of the benefits open to "other ranks" in the R.A.F.

Doubtless other and better subjects, and appropriate audiences, will suggest themselves to those at the Air Ministry who may be considering this question. One merely offers the foregoing notes as perhaps suggesting some fresh lines of thought, which may also be of use to people in the Royal Aeronautical Society and the Society of British Aircraft Constructors who may be, as some certainly will be, asked to co-operate with the Air Ministry in making a success of the Conference. For, if the Air Ministry does decide on lectures instead of on debates, one is none the less desirous that the Conference shall be a success.

The worst of all the drawbacks to the Chautauqua Conference is that it would necessarily take a long time to select the people who would be invited to compose the audiences, and to send out the invitations, and to receive and check replies, to send fresh invitations to fill up gaps caused by refusals, and to select and arrange for speakers to take part in the discussions following the lectures. In fact, one doubts whether it could all be done on a fully adequate scale by March or April. Therefore one's personal feeling is all in favour of a Witenagemot.

### A Real Air Parliament.

If it be decided ultimately that the Conference shall be a real Air Parliament, then the position of the Aircraft Industry, constructional and transport, must of necessity be quite different in relation to the Conference from its attitude towards a Chautauqua.

In an Air Parliament everybody who has a suggestion to make for the good of Aviation, or a criticism to utter against the way in which aeronautical affairs have been handled, or mishandled, should be encouraged to get up and talk about it. For this reason the Aircraft Industry should be invited in large numbers, and the only people outside the Industry who would be of any considerable account would be the chiefs of the trade and technical newspapers, who could set before their own trades the lessons to be learned at the Conference, either as regards the mistakes made by the Aircraft Industry or as regards the benefits which their trades could receive by using air transport.

### The Trade Press.

One desires particularly to emphasise the importance of the Trade Press, both to the Air Ministry and to the Aircraft Industry. It is on the trade of this country that Air Transport and the Aircraft Industry and the equipment of the R.A.F. and the efficiency of the R.A.F. and the continued existence of the Air Ministry depend, each on the other like a pile of bricks.

The Trade Press has far more power to influence the business community than has the Daily Press. Therefore it is the Trade Press which should be converted to a belief in Air Transport. The Daily Press does not matter, except that every time it booms an aeroplane crash it may frighten a passenger or two away from the air lines. The Trade Press, on the other hand, can influence goods traffic and the use of the air mails.

If proof is desired, take the case of the Aircraft Trade. Knowing the appalling rot written about aircraft in the Daily Press, does anybody in the aeronautical community care two hoots for any advice given about aviation in the daily newspapers? Of course not. But if the Aircraft Trade papers make a pronouncement on aviation, then the aeronautical community sits up and takes notice.

Similarly, if a daily paper tells a draper that he can get goods from or to the Continent by air better than by boat and rail, the draper, knowing the rot the papers publish about drapery, is left stone cold. But if the *Draper's Record* tells him to use air transport he is very considerably interested. Therefore it is much more important to convert the *Draper's Record* to a belief in aviation than, say, the *Matutinal Moan*, or any daily paper of similar nature.

Apart from which the editor of any trade paper and his staff are necessarily specialists in their own trade, and, being inevitably intelligent men, are particularly keen to appreciate anything which will benefit that trade. On the other hand, the editor of a daily paper is generally a jack of all trades and, very obviously, a master of none, and his hooligan reporters have no intellect to be converted to a belief in aviation or anything else.

Therefore the Air Conference should be organised with a particular eye towards enlisting the very powerful aid of the Trade Press of Great Britain and the Dominions Overseas.

### The Better Plan.

Moreover, the Free Parliament scheme has the particular recommendation that it can be organised in a much shorter time than a series of lectures. All that is necessary is to fix on a few good speakers and arrange for each of them to deliver a short and provocative speech in favour of a specific motion. Two or three other speakers, for and against, can be secured to follow them. And when once the debate gets going the difficulty will be to stop it rather than to find other speakers.

All these preliminary arrangements can be completed in the time it would take to find people of sufficient eminence who would be willing to devote their time to composing a lecture. The amount of printing and paper will be materially reduced. In fact, the whole of the organisation will be very considerably simplified. And it is quite certain that not only will the ultimate result of the debates be much more valuable than any series of lectures could be, but the debates themselves will be infinitely more amusing. Therefore, by all means let us have Mr. Winston Churchill's "Air Parliament," and let us have it in March.—C. G. G.

## THE FUTURE OF MR. CHURCHILL.

It is rumoured that Mr. Winston Churchill is to accept the office of Secretary of State for the Colonies in place of his present dual appointment as Secretary of State for the Departments of War and Air. When further details are available the matter will be treated at greater length.

# A NEWSPAPER SCOOP.

The ambition of every newspaper is to secure what is technically called a "scoop" over its contemporaries. A scoop consists in getting a piece of news, or a piece of inside information, before any competitor secures it.

"Scoops" are not confined to newspapers, though the word was used in this particular sense by newspapers before any other trade adopted it. In these days scoops are made by people of every sort. For example, it was distinctly a scoop to be the first to use the mighty Port of London as an aerodrome for a regular air service.

Here is seen the Fairey Seaplane (Rolls-Royce Engine) with which this scoop was made.

This machine was chartered by that enterprising paper the "Evening News," in June, 1919, to carry its products day by day from London to Margate. The pilot was Mr. Sidney Pickles, the well-known Australian aviator.

The machine used to fly from its shed up-river at Isleworth and alight between Waterloo Bridge and Blackfriars Bridge, practically alongside Carmelite House. There it used to take aboard its cargo of the "Evening News," taxi down river and get off, according to the direction of the wind, below the Tower Bridge.

Day after day with remarkable regularity it delivered its cargo at Margate, with the result that the good dwellers in the Isle of Thanet received their afternoon news from London hours before people much nearer Town, who had to depend on the old-fashioned railway for delivery.

Having proved its value and efficiency beyond dispute the service was discontinued merely because under the conditions then existing, the cost of operating an air service was too high to make it worth while for one newspaper to run it. But it proved another point, namely that the Port of London (which is all the Thames below Teddington Lock, where the tide-way ends) is London's best and most natural aerodrome.

Since then the Port of London Authority has been holding special committee meetings and sending representatives to investigate various types of hydro-aeroplanes to see whether other machines can be trusted onto their sacred waters to do what the Fairey Seaplane did successfully for weeks as far back as June, 1919. There is, of course, no doubt about the Fairey, for it was the Fairey, as usual, which did the pioneer work of proving to the Port of London Authority that it possesses London's best aerodrome.

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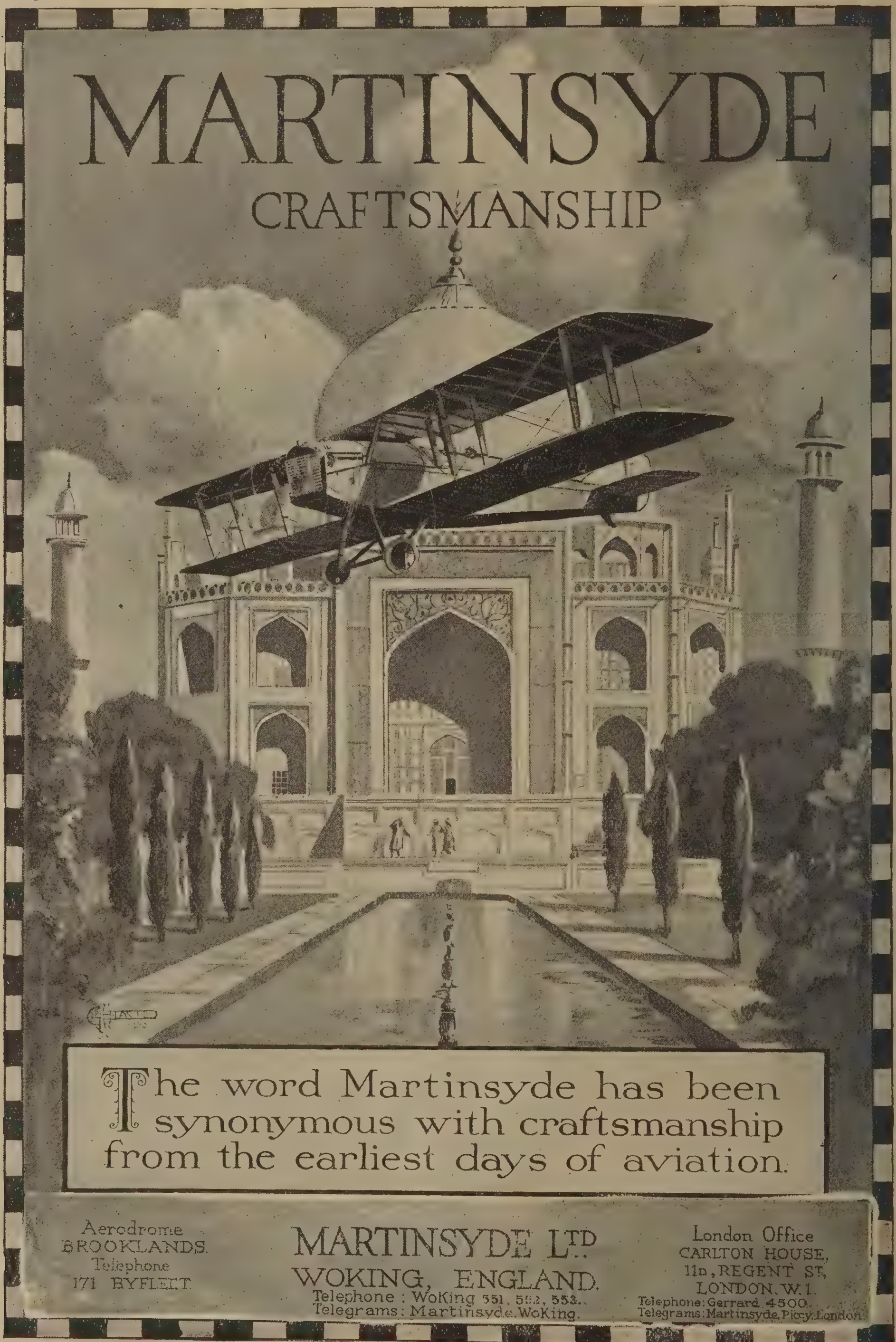

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## THE WEEKLY COMMENTARY.

The publicly issued version of the report of the Judges' Committee on the Air Ministry competition for civilian aircraft printed below, together with some brief comments upon certain of the points raised therein.

In an article on the Soaring Bird question Capt. Sayers shows that most of the observations relied upon to prove that there is something mysterious in the behaviour of the bird's wing could be predicted from the known principle of aerodynamics. Also it is shown that the fact that birds can soar by no means proves that a more heavily loaded and faster type of aircraft can be persuaded to do so.

A German attempt to make measurements of the forces acting on a full-size aeroplane, instead of merely on models, is described on page 64.

The Lamblin Radiator, which has become almost a standard fitting on all high-speed French machines with water-cooled engines, has scarcely been used at all in this country. A description which appears in this issue indicates the essential features of the type, and should prove interesting to British readers.

## THE OFFICIAL REPORT ON THE AIR MINISTRY COMPETITIONS, 1920.

(With Comments by Capt. W. H. Sayers).

The Air Ministry announces :—

These competitions were held during August and September last, with the object of ascertaining the best types of aeroplanes and amphibians which would be safe, comfortable, and economical for air travel and, in the case of the amphibians, capable of alighting on and rising from water as well as land. Details as regards the rules of the competitions, the entries received, the actual competitors and the prizes awarded have already been published, and competitors have also received a technical report of the Judges' Committee.

The broad general conclusions of that Committee are summarised below.

### The Value of Reserve Power.

One effect of the rules of the competitions was to encourage the production of aircraft having an ample reserve of power. To obtain this reserve without sacrificing economy or useful load entails the use of an engine of high power for its weight, but normally run well below its maximum power. The advantage thus attained in regard to safety is clearly shown in the greatly increased ability to arise out of a confined space, while the reduced normal strain on the engine largely assists in producing a reliable machine.

In spite of the higher first cost of such an aircraft it is almost certainly a better commercial proposition than a machine with the same normal performance and little or no reserve of power.

### The Importance of Controllability.

As regards landing in a confined space, the pilot's view and the controllability of the machine are two very important factors, and there is some tendency to place upon them insufficient weight.

The run on the ground after such landings can be reduced if suitable wheel brakes are fitted, and very promising designs were exhibited by some competitors.

The precautions taken by designers to avoid any risk of fire in the air and largely to reduce the risk of fire in the event of a crash showed that this important point had received due attention, and ideas embodied in competing machines will be of definite value in future designs.

### Of Amphibians.

The amphibians also displayed a marked advance towards safety in another direction. Capable of alighting on and rising from any practicable site on land or water, they have a great advantage over other forms of heavier-than-air craft, while the low position of the hull very largely reduces any risk of injury in the event of a minor accident on the ground.

[It will be noticed that the Judges seem to regard the flying-boat type as the only existing or possible amphibian. Perhaps there is something to be said for the float type also. —Ed.]

This type of aircraft has a high potential value for commercial purposes, as its use will in many cases very much shorten the distance to be flown and also enable passengers to be landed on a river in the heart of a city instead of on an aerodrome some considerable distance outside.

In regard to twin-engined machines, further information was gained as to the conditions determining their ability to fly on one engine, and it was clearly shown that, given adequate attention to certain details of design, a twin-engined machine can fly on one engine, thereby increasing its reliability and safety.

### An Advance in Comfort.

Aircraft designed for commercial use show a marked advance in comfort over those originally designed for war purposes and afterwards modified to suit civil requirements. Seating accommodation, heating and ventilation arrangements have reached a very fair standard of comfort, but in this respect the question of silencing the engines has not yet had sufficient attention. The design of aircraft as affecting their economical use is of great importance commercially, and in this respect the competitions brought forward many excellent points in detail design.

The reduction in the number of parts subject to wear, and the increased accessibility of those requiring attention, was attained in competing machines to such an extent as to offer a considerable improvement in economy of maintenance.

### Of British Accessories.

The rules of the competitions permitted the use of secondary equipment of foreign manufacture.

It is satisfactory to note, however, that the items of foreign equipment utilised by competitors were insignificant in number and practically confined to petrol gauges, in which connection it was remarked that no really suitable gauge showing the quantity of petrol in the tank was fitted on any competing machine.

The magnetos fitted were all of British design and construction. While there is little doubt but that when a few mechanical details have been improved the British magneto will be the best in the world, the results of the competitions show that the British magneto manufacturers are now abreast of any of their foreign rivals.

### Some Comments.

The report reproduced above may be taken to be part of the general report made to the Air Ministry by the Judges' Committee. There is fairly good reason to believe that there exists a very considerably more voluminous report, which has been divided up into three sections.

These sections are (A) A general summary, innocuous in its terms, produced for general consumption and reproduced above; (B) A full and frank expression of the judges' opinion of the competition machines which it may be supposed is reserved for internal consumption by the Air Ministry; and (C) A series of detailed reports upon each individual machine, prepared for the benefit of the designing firm, and supplied so far as concerns their own machines to each such firm.

Of these, Section (B) would doubtless be of considerably the greatest interest, but it can scarcely be hoped that its contents will be published for some long time.

The report actually published adds little to what is already known regarding the competitions.

The opinion expressed as to the commercial value of an ample reserve of power, and as to the importance of an excellent view and of a high degree of controllability, should be noted. The importance of the two latter features in their effect on the possibility of landing safely in confined conditions have, as the report states, not been given adequate consideration.

The subject of control at low speeds in particular has received very little attention, and there is no room for doubt that there are in existence to-day aeroplanes which could be landed at from 5 to 10 m.p.h. slower than is now practicable if a little care were expended on the design of their control surfaces, particularly their ailerons. It is highly satisfactory to discover that, in the opinion of the judges, so much good work has been carried on in the improvement of detail design, in the reduction of fire risk, and the improvement of comfort.

The final notes as to the practical absence of non-British accessories, and the excellent performance of British magnetos, are of a pleasing nature.

The absence of any reliable petrol gauge is natural, as, so far as can yet be discovered, no such thing exists. This item is one of considerable importance, and offers an excellent opportunity for the exercise of inventive ingenuity. A simple and reliable petrol gauge which will indicate accurately and at a distance the contents of fuel tanks without being affected by surging of the fluid or changing inclination of the machine, which can be applied to any practicable form of tank, would find a wide sale both for aircraft and for road vehicles. [Mr. Fritz Koolhoven invented something very like it about three years ago.—C. G. G.]

In the case of aircraft, the production of such an instrument would be of very great value—so great that as soon as such a fitting is obtainable it should certainly be made a compulsory part of the equipment of any licensed aircraft.—W. H. S.

# THE SOARING FLIGHT OF BIRDS.

By Capt. W. H. Sayers.

The flight of birds has for long been the subject of discussion, and many hopes have been built upon the supposed possibility of soaring man-made aircraft—if once the secret of bird flight can be discovered. Accurate observation of the actual flight of birds is difficult, and soaring birds are not very common in the more temperate regions of the earth. There is, however, a fair volume of recorded observation of the flight of certain types of soaring bird, and in particular the "cheel" seems to have attracted much attention.

Captain Wildeblood's observations of this bird appear to agree very closely with those made by Dr. Hankin, and there is therefore a certain amount of well-confirmed qualitative evidence as to their behaviour.

### Observed Facts.

This evidence can be summed up more or less as follows: (1) Soaring rarely occurs in absolutely calm weather. (2) Cheels start soaring in quite light breezes; other less effective soarers wait for stronger breezes. (3) In general, soaring birds circle to gain height. Under certain conditions, however, they can apparently soar straight into a strong breeze, not losing, and possibly gaining, height continually. There is in addition a mass of interesting—if somewhat irrelevant—data as to the movement of their control surfaces under these conditions of flight.

Among the points made particularly by Captain Wildeblood are the two following:—

(a) The apparent angle of incidence in soaring flight is approximately zero.

(b) In circling flight, height is gained markedly on the up wind part of the path, but not noticeably on the down wind path. On the up wind part of the path the wings are practically horizontal, on the remaining part of the path the wings are heavily banked.

### An Inferential Conclusion.

There is a further important piece of indirect evidence. Capt. Wildeblood refers specifically to cases where circling birds make leeway in strong winds. This may be accepted as strong presumptive evidence that normally such leeway is not made, i.e., the bird moves in a spiral path whose axis is vertical and fixed relatively to the ground, and the net resultant horizontal velocity of the bird is roughly zero. It is at least marked less than the mean horizontal wind velocity.

### The Up-Current Theory and its Results.

Before dismissing the theory that soaring flight is due to up-currents, it is at least well to consider what phenomena the theory will account for.

In the first case, direct vertical air currents of appreciable magnitude with no horizontal winds are possible. They are unusual, because the only conditions which will produce them are those of a large level surface uniformly superheated by some means above the mean temperature of the air above that surface. This surface, in addition, must not have around it any conditions tending to produce winds with horizontal components which would blow across it.

Generally, when such an unaccidented surface is superheated by radiation, its more varied surroundings are also more or less superheated, and air convection currents with a horizontal component are set up which disturb the air over the uniform surface. Therefore, it does not seem unnatural that relatively high vertical wind velocities commonly occur coincidentally with fairly high horizontal velocities.

Consider the case of a bird gliding in still air, with, let it be assumed, the chord of the wing horizontal. (Fig. 1.)

Let AC represent the gliding path, and velocity, then the angle of incidence of the chord to the relative wind is equal to ACB, since CB is horizontal and parallel to the chord. Because the bird is gliding it is obvious that the vertical lift, due to the relative air speed AC at the angle of incidence ABC, is equal to the weight of the bird. There is obviously a forward component of the force acting on the wing, otherwise the bird would not have the horizontal velocity represented by CB. This only means a component forward of a vertical to the *chord line* of the wing—which is a characteristic of decent wing sections—and not a component forward of the vertical to the true air direction which is needed for any of the "perpetual motion" theories of bird flight.

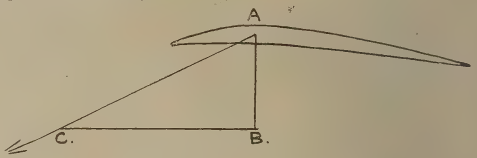

Fig. 1.

It is immaterial so far as the forces produced are concerned how this relative air velocity is produced. If the wind is moving in the line AC at the velocity AC in a direction opposed to the gliding movement of the bird in still air, then relatively to earth the bird will remain stationary. If the air has an upward velocity equal to AB, but no horizontal velocity, the bird will not lose height relatively to the ground, and will move forward, relatively to both the ground and the air at a velocity BC. However this relative wind is produced, the bird is dropping through the air at velocity AB, and moving forward through the air with velocity BC.

### The Condition for Soaring.

To produce soaring it is obvious that the only essential condition is the existence of an upward air velocity at least equal to AB—which is the vertical component of the bird's gliding velocity in still air.

A forward component of the force on the wing, together with a horizontal chord line is therefore consonent with the conditions of flight in rising air currents.

Now, from what is known of the vagaries of air currents it seems very unlikely that the vertical component of a wind is usually uniform over very large areas. It seems probable that higher vertical speeds will be encountered over definite surface features—say over a particularly highly superheated piece of ground. If a soaring bird wishes to gain height at as great a rate as possible, he must remain within the limited area of one of these marked upward currents.

### Alternative Methods of Gaining Height

There are two possible methods of doing this. If the horizontal wind velocity is within the bird's soaring speed range, he may fly into the wind, with an air speed equal to the wind speed, and remain stationary over a fixed spot on the earth, rising vertically. It seems obvious that this is a rare proceeding.

### Circling.

Alternatively he may circle. If he flies in true circles relatively to the air, obviously he will make leeway at the speed of the wind, and will be blown away from his rising current.

To keep in it he, therefore, must either fly longer up wind than he flies down wind, to make his path relatively to the earth of equal length on the two sides of the circle, or he

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must fly faster (at a higher air speed) into the wind than with it.

The evidence points to the former alternative of equal air speed in circling flight.

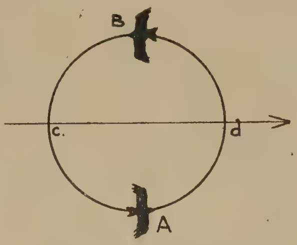

Fig. 2.—**Circling Flight in a wind of direction c—d.**

The arrow (Fig. 2) represents wind direction, and the circle the plan view, seen from the earth, of the bird's path. At A he moves at a greater speed over the earth than when at B, and to make up for the distance travelled over the ground at A in unit time, he has to fly more than unit time at B. That is to say, over the B half circle up wind, he spends more time than over the down wind semi-circle of A, despite the fact that the true air speed is the same.

### The Up-Wind Climb.

If the up current is uniform over the whole circle, his rate of climb per second will also be uniform, and therefore he will climb further on the long half than on the short half of the circle. Also—relatively to earth—his angle of climb will be steeper up wind than down wind—although relatively to the air he will be falling steadily at his gliding angle over the whole circle.

### The Varying Angle of Bank.

Also on the two halves of the circle he will turn through an equal angle of 180 deg. The time taken on the path dBc is longer than the time taken on the path cAd, i.e., the rate of turning in degrees per second, is higher down wind than it is up wind. Since the correct angle of bank is a function of the rate of turning, the bank will be steep down wind and flat up wind.

These considerations appear to account for almost all of the relevant observations of the facts of soaring flight—for the movements of wing-tip feathers, etc., are either control movements or they are variable camber devices used to make the best of the varying air conditions.

### The Alleged Promiscuity of Soaring Flight.

There is one other point which is asserted as discounting the up-current theory, and that is the alleged fact that birds under certain conditions can soar in any direction over vast areas without losing height, and that this would imply continuous and uniform up-currents over large area. In regard to this there has recently been published a paper describing the experiments made by M. P. Idrac in French Guiana. This gentleman made actual measurements of air velocities, and established the existence of numerous up-currents. He showed that soaring birds were only to be found climbing in regions where such currents had been established. It was also shown that the apparent free flight of soaring birds actually occurred in these cases by a process of climbing in one current, and then gliding to another, regaining height and again gliding.

Capt. Wildeblood and others state that from observation height is not lost in such gliding—but their assertion rests on visual observations, and not on measurements. The fall of a bird with a gliding angle of 1 in 15 to 1 in 20, when that bird is some hundreds of feet distant, and high above the observer, might easily escape a very keen sight. Also birds have a wide speed range, and, in a strong up-current, after gaining the height they need, may cease climbing and increase their air speed while in the up-current. Then leaving it, they may gradually decrease their air speed and so obtain a falsely flat gliding angle—just as an aeroplane brought down at high speed and flattened out may fly level or nearly level at the expense of a drop in speed.

### Some Minor Points of Fact.

There are certain other relatively minor points which a little thought may help to clear up.

It is quite possible that in circling flight, the bird may fly at a greater incidence down wind, in order to reduce speed, and so the difference in ground speed on the two sides of the circle. This slow speed may be a worse climbing speed, i.e., the rate of fall in still air may be greater, and this would account for a less climb on that part of the circle.

Another point is that most capable soarers are birds of prey, and that their object in soaring is to observe for food. They are not desirous of travelling for its own sake. Therefore they circle over limited tracts of country and keep a look out. If the wind is too strong to circle comfortably, or if the vertical current is not sufficient to maintain circling flight—for circling flight demands more energy than straight flight—it seems not unnatural that they should choose an up-wind direction to keep their ground speed at a minimum. This condition will help observation and will keep them near home.

Flapping birds usually fly with the object of reaching some definite spot, and they are not content to have their path determined by the exact condition of the air. They have not, therefore, developed the soaring faculty, and probably soar badly.

### Concerning Purely Vertical Winds.

Capt. Wildeblood's statement that an upward current over the whole of the parade-ground involves the supposition that the current comes up out of the ground is erroneous. What actually happens is that over any section above the ground there are at the same moment particles of cool air falling and particles of warm air rising. The phenomenon may be observed in the case of water by heating a transparent vessel uniformly at its base and watching the movements of small particles of suspended matter.

Over any given element of the area of the parade-ground equal masses of cold air and of hot air will fall and rise in any given time.

Consider an area such that one cubic foot of cold air falls onto it per second. Assume that the temperature of this air is 15 deg. C. and that on contact with the ground it is raised to 35 deg. C. It will expand and its volume will become

$$1 \times \frac{273+35}{273+15} = 1 \times \frac{308}{288} = 1.05 \text{ cub. ft.}$$

The upward current over that surface will become 1.05 cu. ft. per sec. instead of 1.0 cu. ft. per sec.—i.e., the velocity of the upward current will be 1.05 times that of the downward one.

The density of the two currents will be in inverse ratio to the velocities—that is, the density of the cold air will be greater than that of the hot air in the ratio of 1 to $\frac{1}{1.05}$.

The energy represented by an air current is proportional to its cross-section, to the square of its velocity, and to the density of the air. The two currents are of equal cross-section, therefore the energy of the downward current may be represented by $1^2 \times 1 = 1$ and that of the upward one by $1.05^2 \times \frac{1}{1.05} = 1.05$, and there is therefore an effective up-current whose energy is $1.05 - 1 = 0.05$, or 5 per cent. of the kinetic energy of the cool down-current. The mean effective upward velocity of the combined currents corresponding to this is $\sqrt{1} - \sqrt{1.05}$ = approximately 0.025 of the velocity of either the upward or the downward components.

### The Velocity Needed for Bird Flight.

The value of the net upward velocity required to account for soaring is surprisingly small. Assuming that Nature has succeeded in building wings as efficient as the "Alula," we may take values for the lift coefficient of 0.7 and for the L/D ratio of 21. For the complete bird the L/D and the gliding angle will not be worse than 16 and 1 in 16 respectively. For a loading of 1lb. per sq. ft. this gives 17 m.p.h. = 24 ft. per sec. as the supporting speed, and $\frac{29}{16} = 1.5$ ft. per sec. as the rate of fall when gliding. An up-current of 1.5 ft. per sec. = about 1 m.p.h. would account for soaring in this case.

It is easily possible to demonstrate the existence—even in England—of up-currents over sun-heated surfaces of the strength required to produce soaring in inanimate models, if the loading of the surfaces is kept to limits such as those used by birds, at times when no appreciable wind or when steady, gentle winds are blowing, and under circumstances where currents deflected upward by obstructions cannot be present.

### The Aeroplane Under Similar Conditions.

The question of air density, and the difficulty of flying in hot air with an engine-driven aeroplane, introduces entirely different problems. The up-current of 1.5 ft per sec. which suffices entirely to support a machine with bird loading and bird qualities is useless for the engined-aeroplane. This has probably a loading of 8 lb. per sq. ft., a minimum flying speed of 50 m.p.h., and a gliding angle certainly no better than 1 in 10—and that at a higher gliding speed than 50 m.p.h. The probable least speed of descent, gliding, of such a machine is not less than 7 m.p.h.—a little over 10 ft. per sec.—and this upward velocity is the least which would suffice to make it soar. The velocity of 1.5 ft. per sec. would add to the lift to the extent of roughly $\frac{1.5^2}{10^2} = 2.25$ per cent. of the total weight of the machine.

Against this the reduced air density reduces the effective horse-power of the engine roughly inversely as the density that is for a temperature rise of 20 deg. C. above normal by about 5 per cent., and increases the minimum speed of flight, and therefore the horse-power required, by about $2\frac{1}{2}$ per cent. The drop in the surplus power available for getting off and climbing is therefore large compared to the extra lift due to the up-current.

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The velocity of the up-current required to account for soaring is in any case equal to the vertical velocity of descent gliding in still air. That is for any machine under any specified condition it is equal to flying speed multiplied by gliding angle at that speed.

For similar wings, at the same angle of incidence, therefore, the upward velocity required is proportioned to the flying speed and therefore to the square root of the loading. That is, an aeroplane loaded 9 lb. per sq. ft. requires an up-current three times as great in velocity as a bird loaded 1 lb. per sq. ft.—other things being equal. Added to this, if the aeroplane gliding angle is 1 in 8 instead of the bird's 1 in 16, this fact again doubles the up-current velocity needed by the aeroplane for soaring, which thus becomes six times that for the bird.

### AN UNWARRANTABLE EXPECTATION.

It is perfectly futile to imagine that because a bird can utilise the internal energy of the wind for soaring, therefore the aeroplane can do the same thing. The argument made above holds whether soaring is due solely to up-currents or to some other form of wind energy. It comes to this—that the aeroplane, travelling at three times the speed of the bird, and having twice as steep a gliding angle, requires the expenditure of 54 times the energy per sec. per sq. ft. of supporting surface which is required to support the bird; and it is certainly not reasonable to assume that because the bird can extract the small amount of energy which it needs, that the aeroplane can extract immensely greater quantities of energy from the same air. Soaring on light gliders at about 1 lb. per sq. ft. loading is certainly possible, but this is quite a different affair from soaring on practicable high-speed load-carrying aeroplanes.

If it is to soar it must extract this energy from the air, and the question resolves itself into the one of whether sufficient energy is present in the mass of air which acts on the actual surface employed. It is certainly not reasonable to argue because it is a common occurrence for the energy content of a cubic foot of air to suffice for the support of a bird that therefore it will be a frequent occurrence for the energy content to reach to the much higher values needed to support the aeroplane. Soaring is possible, it has even occurred, on man-built aircraft, but only when the conditions of speed and loading have been comparable to those observed in the case of birds.

### THE POSSIBILITIES OF SOARING BY MAN.

With the modern knowledge of aeronautics and of aircraft construction, with a competent pilot and an intelligent study of the habits of soaring birds, there is no practical doubt that soaring, under favourable conditions, could be made a certainty. By this is meant not merely that it would be possible to rise slightly above starting-point, but that it would be possible to remain in the air for as long as the favourable conditions continued; or, having used the soaring conditions in one spot to gain height, to glide through non-rising air to a desired destination—possibly another rising current where height could be regained.

The "mysteries" of soaring flight, like many others, become less and less mysterious the more the facts of the case are brought down to measurable terms. Like most such mysteries, they are mainly manufactured in the brains of those who cannot think quantitatively and have no mental measuring equipment.

## A GERMAN AEROPLANE TESTING PLANT.

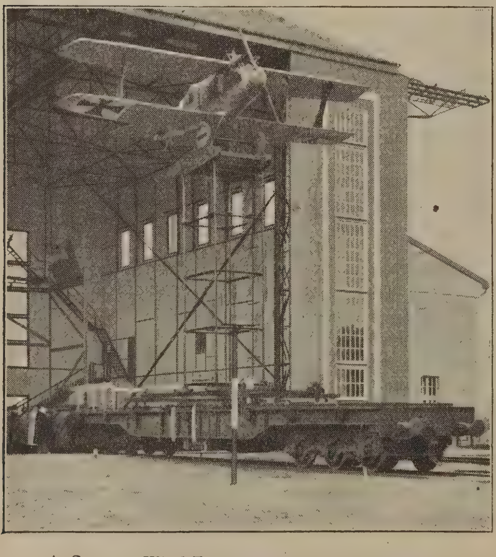
The following account of an interesting German attempt to make aerodynamic tests on full-size aircraft has been supplied to The Aeroplane by a German technical correspondent :—

Up to the present experiments to determine the resistance, lift, and the conditions of stability of aircraft in aerodynamic laboratories have been carried out by the use of reduced scale models exposed to artificial air-currents. In Germany such experiments have been made at Göttingen, at Aix-la-Chapelle and at Dessau.

But such tests only provide results which need corrections before they can be applied to full-sized machines, and to arrive at these corrections experiments must be made with full-size machines in order to discover the exact amount of difference due to the change in scale.

This fact made it seem desirable, as far back as 1916, to make tests on a full-sized aeroplane, drawn through the air by some suitable form of tractor. The German official testing station at Adlershof, near Berlin, had even in 1913-14 considered such a scheme, but it was not till later that it became possible to put it into execution; and in 1916 work was started on the equipment necessary for these trials

The site chosen was the Schönberg-Zossen-Jüteborg line of railway. The equipment is shown in the attached photograph. Upon a special railway truck there was erected a tower of steel tube, 10 metres high, upon which the aeroplane under test was to be mounted. The aeroplane was attached to the tower through hydraulic dynamometers, which gave readings on the truck itself, from which the lifts, drags and moments exerted on the aeroplane could be measured.



A German Wind-Tower for Experimental Work.

The tower itself was orientable that the machine might be made to face into the resultant wind due to the speed of the truck and of any wind which might exist. The tower was also equipped with air-speed measuring appliances.

Generally speaking, tests were confined to early morning or evening hours, when the steadiest wind conditions may be expected. The test truck was drawn by a locomotive at speeds limited by the conditions of the track to a maximum of about 60 k.p.h.—a speed considerably lower than that usual to modern aircraft, but still sufficient to obtain results of considerable value.

During the period 1916 to 1918 a number of difficulties were encountered in the efforts to use this apparatus, and it was not found possible to carry out as many tests as had been hoped for. Nevertheless, the tests carried out sufficed to prove the value of such full-scale measurements, and to indicate that such a scheme, properly carried out, would be of great value in the development of aviation.

The apparatus was finally got into satisfactory working order towards the end of 1918, but under the provisions of the Peace Treaty it has been deleted, and it is therefore impossible to continue experimental work therewith in Germany.

[Precisely why it should be deleted is difficult to understand, seeing that it would be of the greatest possible value to Civil Aviation. Presumably this is another example of the spitefulness or imbecility of the Inter-Allied Aeronautical Commission.—C. G.G.]

## A BOOK FOR WIRELESS STUDENTS.

The Thermionic Valve in Radio-Telegraphy and Telephony. By J. A. Fleming, M.A., D.Sc., F.R.S.

This book has now been available for about a year, and although important progress has been effected since the date of its first appearance in the subject of which it treats, it still serves as a useful introduction to the various practical applications of the thermionic valve in present-day wireless telegraphic and telephonic apparatus. The first chapter deals briefly with the original researches in connection with the characteristics of the early types of valve receivers.

The central chapters, which are liberally illustrated with diagrams and curves, are mainly concerned with the practical evolution of the three-electrode thermionic valve as an efficient receiver, and also as a generator of electric oscillations. A good deal of interesting information is given and all important features of development are discussed.

For the aircraft wireless engineer some interesting information will be found in the chapter on "The Thermionic Oscillator in Wireless Telephony." The problems of commercial aviation wireless are to-day mainly concerned with radio-telephony, and Chapter VI gives a very brief account of valuable pioneer work. This book should serve as a useful introduction to the study of thermionic valves.

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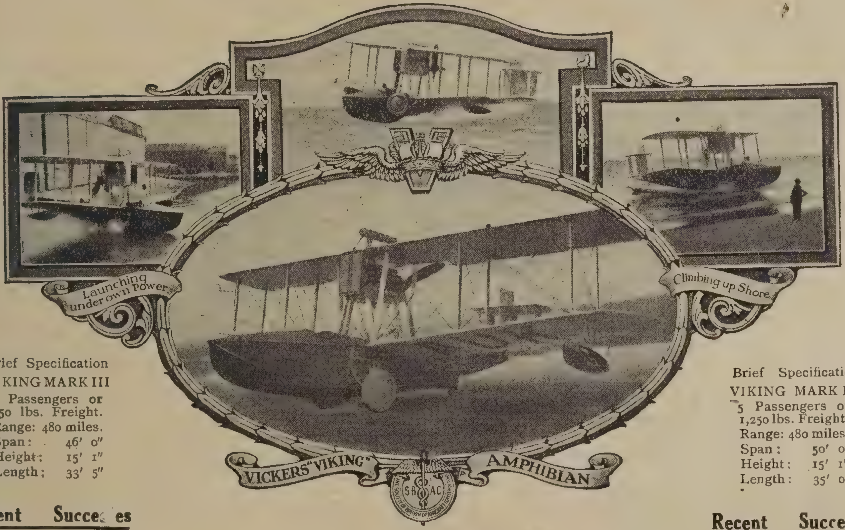

Brief Specification
VIKING MARK III
5 Passengers or
750 lbs. Freight.
Range: 480 miles.
Span: 46′ 0″
Height: 15′ 1″
Length: 33′ 5″

Brief Specification
VIKING MARK IV
5 Passengers or
1,250 lbs. Freight.
Range: 480 miles.
Span: 50′ 0″
Height: 15′ 1″
Length: 35′ 0″

**Recent Successes**

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

1. **Shortest time in "unsticking" from water.**
2. **Fastest time over a given circuit.**
3. **Climb to 1,000 metres.**
4. **Altitude with full load.**

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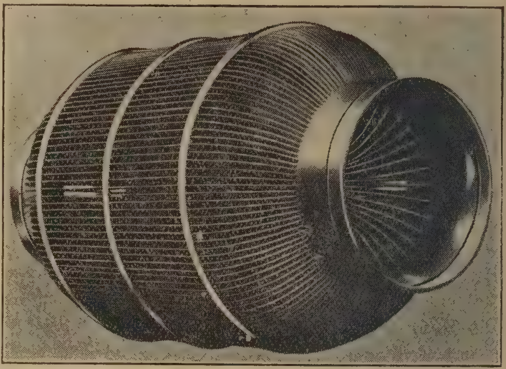
**MANCHESTER—Cathedral House, Long Millgate** (Temporary Address).
**BIRMINGHAM—Vickers House, Loveday Street.**
**NEWCASTLE—Commercial Union Buildings, Pilgrim Street.**
**GLASGOW—Vickers House, 247, West George Street.**
**BRISTOL—55, Park Street. BELFAST—26a, Arthur Street.**
**LEEDS—Greek Street Chambers, Park Row.**
**NORWICH—16, White Lion Street.**

**Recent Successes**

The Vickers Viking was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION September, 1920.

Aviation Department,
VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

# THE LAMBLIN RADIATOR.



Three-quarter view of the Lamblin Radiator.

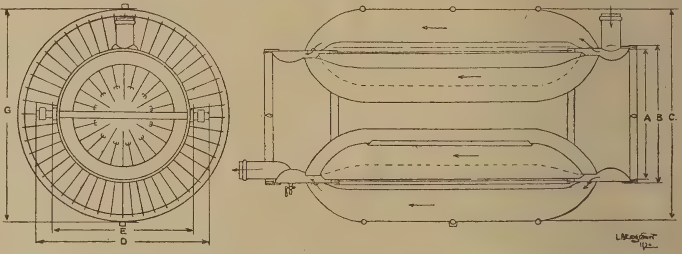
The problem of cooling aero engines has so far been somewhat inefficiently accomplished by the use of honeycomb radiators in most cases mounted in the nose in a position similar to that most commonly found in automobiles. The resistance set up by a nose radiator at all speeds common to aircraft is enormous and extremely important.

Various alternative arrangements were tried during the war, particularly in Germany, such as incorporating a radiator in the centre-section conforming to the wing-section; mounting twin radiators one on either side of the fuselage, thereby allowing the nose to be streamlined; etc.;* but although these schemes partly accomplished their object they were by no means entirely successful, and the high cost of production of the special radiators completely outweighed their advantages. About three years ago a French engineer, M. Lamblin, brought out a radiator of new design, specially adapted for use on aircraft, that has proved on test to be considerably in advance of all previous designs.

In ordinary nose radiators the air is compelled to pass through extremely small tubes very short in length and consequently a large area of cooling surface is necessary to satisfy the cooling requirement of a modern medium-powered aero engine.

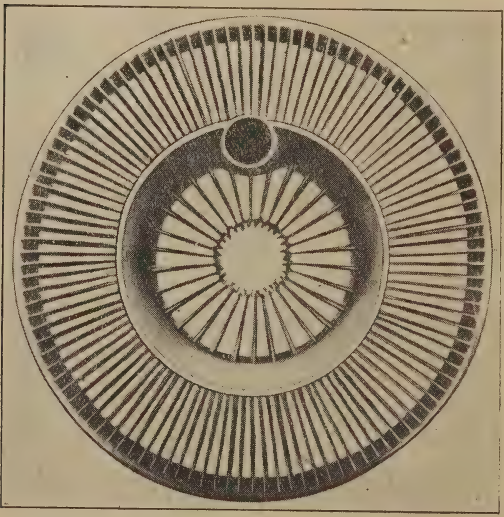
In the Lamblin radiator which is shaped much like a lobster-pot, having the water-spaces set longitudinally and radiating from the centre, the air has a much freer passage through the radiator and owing to the length has a considerably greater effect than on the ordinary type radiator.

The general scheme of construction is clearly shown in the drawing here reproduced. At each end of the radiator is an annular water-passage serving the purpose of the header and bottom tanks of the normal type of radiator. These two annular spaces are connected by the series of radially set flattened tubes which connect the two. Of these tubes there are two sets, one projecting out beyond the extreme radius of the end rings, and the other projecting inwards nearly to the centre of the radiator. The water flow is straight through from one end to the other, as indicated by the arrows.



Suitable inlet and outlet connections can be fitted to the end rings at any convenient position or angle.

In tests made at the Eiffel Laboratory it was shown that these radiators possessed double the power of radiation found in a standard honeycomb type aero radiator, their resistance was halved and their weight considerably lessened owing to the decreased weight of water required and the reduction in size allowed by the increased efficiency. In addition these radiators are fixed in position by four bolts only with the result that they are extremely accessible and interchangeable. They can be mounted almost anywhere, a considerable advantage over the ordinary honeycomb radiator, which in most cases is carried in the nose very often some yards in advance of the centre of gravity.



**Head view of the Lamblin Radiator, showing the clear airways.**

Since its introduction the Lamblin radiator has undergone many improvements and modifications. The gauge of the copper employed has been increased as it was discovered that the heat flow was independent of the thickness of the walls of the water spaces. The water circulation has been improved; in fact, all weak points have been eliminated.

Trials have been carried out with radiators suitable for use on automobiles and agricultural tractors and very satisfactory results have been obtained. A radiator with large air space and at the same time possessing two or three times the depth of an ordinary radiator, avoids any necessity for the use of a water pump and fan in automobiles as the absence of anything likely to obstruct the free passage of water allows of perfect thermosyphon circulation. In cars that have been fitted with these radiators for two years perfect radiation has been maintained without the use of a pump or cooling fan.

The simplicity and the rigidity of construction found in the Lamblin radiator gives it a great superiority over the ordinary radiator and it has been proved that repairs can be carried out satisfactorily by relatively inexperienced workmen.

## THE NAPIER ENGINE AT ALTITUDES.

Apropos the recent difference of opinion as between Capt. Sayers and the advocates of a steam turbine plant for aircraft, as to the output of the Napier engine at 10,000 ft., D. Napier and Son, Ltd., make the following statement :—

"The figures that we chose to state as the cruising b.h.p. are based on considerable experience of the running of the engine, and on the importance we attach to the reliability. A cruising h.p. of 375 is available at 2,000 revs. on the ground, and this h.p. can be maintained up to an altitude of 6,500 ft. by opening the throttle. The falling off in h.p. of the 'Napier Lion' engine with altitude is less than the usual curves of allowances for other engines.

"The h.p. available at 10,000 feet at 2,000 revs. is 330, based on 465 b.h.p. at 2,000 revs. at ground level. For racing purposes we can maintain over 500 b.h.p. quite easily.

"In some recent Government official tests we ran for 10 hour periods at 380 b.h.p. with a combined petrol and oil consumption of just under 0.5 lb. per b.h.p. hour. At the completion of these and other tests, the same engine ran for 1 hr. at 530 b.h.p. at 2,210 revs., and it also ran for 1 hr. at 490 b.h.p. at 2,025 revs. These figures are the powers actually developed and require correction for barometer, which gives the h.p. as 522 and 483 respectively."

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*(THE ORIGINAL NON-POISONOUS)*

Is most Economical and Durable and OFFERS THE GREATEST RESISTANCE TO FLAME

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## UNEXPLAINED CRASHES.

The following letter has been received :—

Sir,—As all unexplained "crashes" tend to decrease public confidence in the safety of flying, the following incident which occurred at Yarmouth last summer may be of interest to your readers as a very probable explanation of the unfortunate accident which (as reported in The Aeroplane, Jan. 5th) resulted in the deaths of Capt. Russell and his two passengers.

I was flying a standard three-seater (110-h.p. Le Rhone) Avro converted by Messrs. A. V. Roe and Co., Ltd. On the day in question I had done some forty short flights, without trouble of any sort. I then took up two ladies, and as I was banking to return to the aerodrome (being at about 500 feet) I was surprised to find that the stick was jammed over to the left. The bank, of course, increased and I lost about 200 ft. in a few seconds. Being by then thoroughly alarmed, I exerted full force and succeeded in freeing the stick with such a jerk that, having once got her back on an even keel, I returned and landed with a first soloist's fear of using bank for a turn.

On landing I noticed the rear passenger had her feet below the footboards, but as she denied having felt anything catch her feet I had the whole control system thoroughly examined; but, apart from the fact that the wires were very badly stretched, we found nothing whatever wrong.

We then experimented and found that for a person with small legs and feet it was quite possible to get them down behind the footboards and below the seat longerons, and so to lock the controls.

Knowing the Avro as I do, I think this is the only feasible explanation of the accident referred to. One is apt to forget that passengers (especially ladies) on their first flight are excited or nervous and therefore cannot be trusted to put their feet on the excellent footboards provided for them, and that it is therefore necessary to see that they quite understand where to put and keep their feet before the machine is allowed to leave the ground.

(Signed) David F. Anderson.

Farnborough, Kent, Jan. 10th, 1921.

[It strikes one that it would be better to make floor-boards which keep feet out of the controls.—C. G. G.]

## A GALLANT FRENCH EFFORT.

That excellent aeronautical paper, *L'Air*, has just published a special issue which is in effect a Review of the French Aircraft Industry as it is to-day. The Under-Secretary for Air, M. Flandin, has contributed a preface, which reads as follows :—

> The review, *L'Air*, has the very good idea of publishing a special number exposing the work of our aviation firms and what our aerial navigation companies are expecting to realise.
>
> This review of the French Aeronautical Industry is written by our manufacturers and constitutes a kind of catalogue of French activities and resources at the beginning of 1921.
>
> Such a catalogue comes in time. A few weeks ago the Buc Meeting has been an Aero Show given in the open, in the sky, and was watched most eagerly by a big crowd. This number of *L'Air* seems to me as if it were the booklet of this Aero Show. Such a general presentation made to the public appears to me quite well-timed at this moment of the year, when, in other times, the Chambre Syndicale des Industries Aéronautiques was accustomed to invite us to visit the Grand Palais of the Champs Elysées. It is another opportunity to realise that a book will quite satisfy us, failing the grand show, luxuriously arranged and conducted.
>
> Besides, I hope that this catalogue will become a commercial repertory and that, consequently, it will greatly facilitate the sales and the acquisitions concerning aviation material. In the foreign countries principally similar publications already exist regarding metallurgy, sciences and industries especially. These numbers of "Review" (I am using this word purposely) are sold in the business world in great quantity, tens of thousands; tradesmen and engineers keep them on their desk, and very often consult them.
>
> Why would not the Aeronautical Industry bring a great deal of business? In 1835, no one had foreseen the enormous extension the railway would take. Is it so unreasonable to predict that the aerial transport will become as important?
>
> But if this must take place, I am of the opinion that French Aviation is well placed to hold one of the best positions in the world. Nobody will discuss the services rendered by the French savantes and engineers; everybody knows the progress that has been accomplished by our manufacturers with regard to fabrication. Also everybody remembers that French Aeronautical firms have sold quite a lot of cellules and engines to our friends and Allies during the War. Those are beautiful titles and splendid testimonials to bring forward. I feel confident that the future of French aviation will not be inferior to the tradition and to the examples of its glorious past.
>
> Already a few training schools have been established abroad; they were created, managed and directed by several of our compatriots, and prove to be efficient. Military missions have already spread in Brazil, Peru, Japan, the fame of our machines. A few French lines of Aerial navigation are already working, going over different countries, and which are good for propaganda in Spain, Tcheco-Slovaquie, Poland; they make our industry favourably known in those countries. These are happy and profitable enterprises; let us go ahead in that way.
>
> Nature has generously placed our country to the cross-road of all the important European and even Mondial routes. This is an unequalled position as regard the easiness of radiating abroad. Richelieu has been able to write "It seems that nature has been wanting to present France with the Empire of the Seas, so well are her coasts situated and equally provided with excellent harbours both on the ocean and on the Mediterranean." Let us transpose this right remark, and it will apply to the aerial dominion. France must unite the Old World to the Continents, which constitute the stores of humanity, by her aerial lines; those aerial lines, in their turn, will support her Aeronautical Industry; and this Industry will need no better reference, on the foreign markets, than the progress realised in France by the aerial transport.

France is to be congratulated on the successes which have been achieved. At the same time the British Aircraft Industry hopes to be able to compete in the world's markets as soon as the passing of the present financial stringency permits the re-opening of commercial ventures.

## TRIALS OF THE LIORE ET OLIVIER FLYING-BOAT.

The Lioré et Olivier flying-boat (two 180-h.p. Hispano-Suiza and one 250-h.p. Salmson) has been undergoing tests for some months on the Etang de Berre, Marseilles.

Owing to certain difficulties, the constructors have fitted the machine with an amphibian undercarriage and continued the tests at Villacoublay.

Piloted by M. Martin, the machine on its second test climbed 700 metres, and on its third reached 2,500 metres in 32 min. The ceiling of the machine is reported to be 3,500 metres.

## BRITISH MAGNETOS.

The history of the British magneto industry was the subject of the major part of the speeches which followed the dinner of the British Ignition Apparatus Association, held on the evening of January 12th at the Trocadero.

Col. W. A. Bristow recounted how the supply of German magnetos ceased shortly before the war, and how the then Secretary of State for War dismissed the difficulty by suggesting that Rolls-Royce be told to make 10,000. The immediate result of the failure of German supplies was that Britain had to fall back on American products, which—as many R.A.F. officers and others will remember—were not entirely faultless. It was of the utmost importance that, now that we had built up a magneto industry, we should protect it from the efforts now being made by Germany to destroy it.

Mr. Peter Bennet, chairman of the party, said that by the end of the war the British output of magnetos had reached the enormous figure of 30,000 per week, and that fourteen British firms had embarked in the business. The Germans were now making every effort to return to their pre-war position in this essential branch of industry

The magneto industry is of the most vital importance from a military point of view, and during the war it had been developed in this country to such a pitch of perfection that at least in the latter years the warlike engine was never delayed by the lack of a magneto. Not only so, but those magnetos were of the very highest class. Their achievements since the war—the Atlantic flights both by aeroplane and by airship, the flight to Australia and numerous other achievements—proved that. (It might here have been added that the official report on the Air Ministry Competitions of 1920 contains adequate evidence of the excellence of British magnetos.)

Owing to the high cost of materials and labour in this country, as against the low wages of Germany and the low exchange rate of the mark, German Bosch magnetos were now being offered at £4 each—less than the cost of the raw materials in England.

Under the circumstances, it is perfectly obvious either that some steps must be taken to protect the British industry, or that England must relapse into dependence on German makers for this essential part of the equipment of every motor-car or aeroplane.

Even those who are fervently convinced that there will be no more wars will readily admit that it does not seem fair that those who by embarking their capital in an industry vitally necessary to the conduct of the "war-to-end-war" rendered its prosecution successful should now be abandoned to their fate. The less optimistic will realise the possibility of irremediable disaster if the next war finds the British magneto industry in the same position as that existing in August, 1914.

DH
D.H. 16
D.H. 18
D.H. 1.
D.H. 2.
D.H. 14
D.H. 3.
D.H. 11.
D.H. 4.
D.H. 10A.
D.H. 4A.
D.H. 9R.
D.H. 9A.
D.H. 9.
D.H. 6.
D.H. 5.

## FACTS ABOUT DE HAVILLAND AEROPLANES

During the period of August, 1914, to November, 1918, the number of DE HAVILLAND machines built in Great Britain and the United States of America amounted approximately to 30 per cent. of the total output of Aeroplanes of those two Allies.

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TO THE
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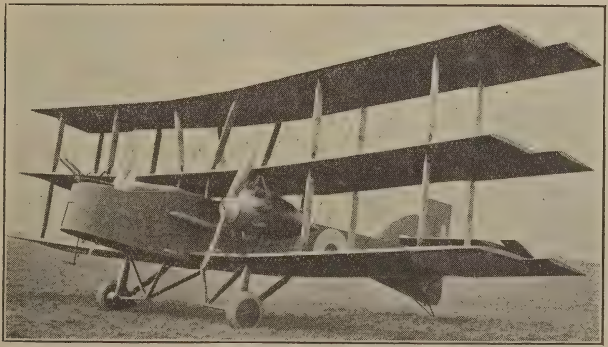

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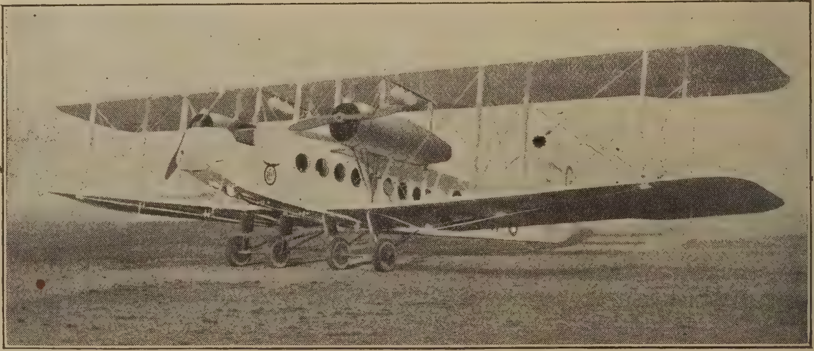

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## GENERAL SWINTON'S RESIGNATION.

It has been announced that Major-General E. D. Swinton, C.B., D.S.O., has resigned his position as Controller of Information at the Air Ministry. No official intimation to this effect has been issued, but one learns with regret that the information is true.

When the Department of Civil Aviation was established General Swinton was appointed to organise the Sub-Department dealing with information. He had a very difficult task and it must be said that he has succeeded in a short time in organising what is now a very useful and efficient Department.

On occasion one has felt it necessary mildly to "pull the leg" of the Department of Information in this paper on account of amusing errors made by subordinate officials, errors which obviously could never have been stopped by the Chief of the Department in that the communicaions in which they appeared would in the natural course of events be issued by subordinates. On the other hand, it must be recorded that communications have been consistently issued to the Press with the most commendable promptitude and accuracy. This was particularly noticeable in connection with the Air Conference last year, when masses of papers, such as verbatim copies of the lectures to be read at the Conference, and similar matters, were sent out in the most satisfactory manner possible.

During recent months, when the work of our air lines was at its height, the movements of aircraft across the Channel were recorded and transmitted to the newspapers with all the promptitude of a well-managed news agency, and in this section alone of the Department much good work was undoubtedly done for civil aviation. Therefore it is to be hoped that if and when a successor is appointed to General Swinton he will be one who has as keen an interest in aviation and who at the same time has General Swinton's appreciation of what ought and what ought not to be communicated to the Press.

General Swinton is perhaps best known to the general public as the author of "The Green Curve," that story being perhaps the one military story which the civilian is thoroughly able to understand and appreciate. There are those, however, who rejoice still more over the title story of his other book, "The Great Tab Dope." Other less known books of his are equally well worth reading.

In the earliest days of the war General Swinton was the official "Eye-Witness" at British Headquarters and, though one realises that it is only paying him a very poor compliment, it must be stated that none of the professional war-correspondents ever approached him in giving real pictures of life on active service. One particularly recalls a delightful little sketch of his, describing a particularly "nutty" car-driver outside G.H.Q. doing his hair in front of a splinter of mirror with a tooth-brush.

Later, when the task of describing the work of the British Army had been relegated to mere journalists, General Swinton was appointed to organise the chaotic business of building up the Tank Corps, and in this he did remarkably good work. One does not know what General Swinton's activities are to be after he leaves the Air Ministry, but one can assert confidently that wherever he goes he will have the good wishes of those who have worked with him.—C. G. G.

## INTER-UNIVERSITY AIR RACES.

On Jan. 5th, the Times newspaper broached publicly an idea which has been discussed on the quiet for quite a long time, namely, a proposal that there should be in future inter-University air races similar to the University boat races, football matches, sports, and so forth.

Such air races were discussed quite a long time before the war, in the days when three undergraduates named Wright, Nichol and Dawson, whose names have become considerably better known during the war, endeavoured to raise in the University of Cambridge an intelligent interest in things aeronautical. But, unfortunately, the Universities have taken little interest in aviation of the practical kind.

The University of Oxford, at any rate, preserved an attitude of philosophic doubt when attempts were made to form an active aerodrome in the Portholme Meadow, though the younger members of the University displayed an intelligent interest in it. At Cambridge, however, the senior people appear to have been entirely hostile. The late W. B. R. Moorhouse, who was the first R.F.C. officer to win the V.C., became distinctly unpopular at that University on account of his active work at Huntingdon, aggravated by his landing on Parker's Piece.

Since the war Cambridge has taken a sort of academic interest in flying. A species of professorship in aeronautics has been founded, and undergraduates are accordingly permitted to study purely scientifically the theory of flying, so long as they do not participate on the active side. Certain undergraduates who had the temerity to fly, and got hurt—one, in fact, was killed—at the R.A.F. Aerodrome at Fowlmere, apparently scared the unprogressive senior people of the University to such an extent that attempts were even made to influence the passing of a "Grace" forbidding flying by the members of the University. Consequently the proposal that there should be an inter-University race was not likely to meet with anything but opposition from the Cambridge University authorities.

Nevertheless, it is hoped that it will be possible to organise an inter-University race. It seems possible that such a race might be held during the Long Vacation when flying officers who have risked their own lives and have taken lives of other people during the war, are no longer treated as little schoolboys by elderly gentlemen with calcareous cerebella. It is hoped, therefore, that much more will be heard of this race now it is no longer necessary to treat it as a deadly secret known to everybody but ourselves.—C. G. G.

## WAR HONOURS.

ORDER OF THE BRITISH EMPIRE.

The King has given an order for the following appointment to the Order of the British Empire for services in connection with the war (to be dated Jan. 1st, 1920) :—

Commander.—Henry Ernest Spry, Esq., Chief Establishment Officer, Aircraft Production Department, Ministry of Munitions.

## THE APPOINTMENT OF A NEW AERONAUTICAL MINISTER FOR FRANCE.

The Cabinet of M. Leygues fell some few days ago and was replaced on Jan. 15th by one formed under M. Briand. In it M. Flandin, the Under-Secretary of State for Aeronautics, was replaced in his office by M. Laurent Eynac. The former has earned the gratitude of those engaged in aeronautics by his devotion to the interest sof the new art. His successor, M. Laurent Eynac, is the proprietor of that excellent French paper *L'Air*, and has in that capacity also done much for aeronautics.

## MR. MALONE AND SEDITION.

On Jan. 17th Mr. Cecil L'Estrange Malone, M.P., at one time Lieut.-Col. in the Royal Air Force and Lieut.-Commander, Royal Navy, appealed at the London Sessions against a sentence of six months' imprisonment in the second division passed on him on Nov. 17th, 1920, for a seditious speech delivered at the Albert Hall on Nov. 7th. The appeal was dismissed, the Chairman stating that he considered the sentence entirely inadequate to meet the offence committed.

## THE AFFAIRS OF THE AIRCRAFT MANUFACTURING CO.

A stormy meeting of noteholders and other unsecured creditors in the Aircraft Manufacturing Company took place recently, Sir William Barclay Peet, voluntary liquidator, presiding.

The company was registered in 1912 and the voluntary winding-up decision was reached on Dec. 23rd last.

The assets were stated to amount to £1,200,000, not allowing for claims to be made against the Government for £1,000,000 in respect of cancelled contracts and after deducting 50 per cent. in respect of holdings in subsidiary companies. The liabilities were estimated to amount to roughly £1,100,000.

A resolution to appoint a committee of inspection consisting of three noteholders and two trade creditors was carried by a large majority.

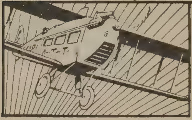
## THE AIR COUNCIL AND RENFREW AERODROME.

On Jan. 11th an action by the Air Council against F. D. Cowieson, contractors, of Glasgow, began in the Court of Session, Edinburgh, before Lord Ashmore.

The Air Council are suing the contractors for £49,908, which is alleged to be the amount by which the company have been overpaid for work done by them in the construction of the Renfrew Aerodrome. Alternatively, the Council sues for £60,000 damages. They allege that iregularities took place in the execution of the contract; in particular, that there was wanton waste and entire absence of competent supervision, and that the labour employed was largely in excess of what was required. Messrs. Cowieson and Co. deny these allegations and maintain that the work was executed as rapidly and as economically as possible.

Mr. James Barr, surveyor, of Glasgow, said that the rate 122s. charged for brickwork worked out at 84 laid per man per day, whereas the pre-war average for a competent man was 900. The arrangement made for the reception of material on the site was insufficient and the methods of handling and storage were ineffective. He found at the main siding brick, slate, crushed granite and metal mixed together, having apparently been dumped out one on top of the other. On the hostel site stacks of radiators lay in the open and showed considerable rusting, and substantial sums of money were represented by such deterioration.

The hearing was adjourned on Jan. 14th until the 17th.



# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.

## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers: and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G.E.A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

JANUARY 10th:

NIL.

JANUARY 11th:

S.N.E.T.A., DH4, O-BADO, London-Brussels, 13.10—, G.&M., Nil, Van Opstal.
G.E.A., "Goliath," F-GEAC, Paris-London, 12.07-15.19, G., 1, Labouchere & 1.
M.A., Breguet, F-CMAH, Paris-London, 12.30-15.56, G.&M., 2, Martel.
M.A., Salmson, F-CMAN, Paris-London, 12.35-16.15, G., Nil, Charpentier.
S.N.E.T.A., DH4, O-BAIN, Brussels-London, 12.25-15.39, G.&M., Nil, George.

JANUARY 12th:

M.A., Breguet, F-CMAH, London-Paris, 12.26-16.10, G., 3, Martel.
G.E.A., "Goliath," F-GEAC, London-Paris, 12.40-16.15, G., 4, Labouchere & 1.
S.N.E.T.A., DH4, O-BAIN, London-Brussels, 13.20—, G.&M., 2, George.
M.A., Breguet, F-CMAI, Paris-London, 12.35-16.04, G.&M., Nil, Le Men

JANUARY 13th:

M.A., Salmson, F-CMAN, London-Paris, 12.30—, G., Nil, Charpentier.
M.A., Breguet, F-CMAD, Paris-London, 12.25-15.00, M., 3, Challoux.
M.A., Spad, F-CMAV, Paris-London, 13.07-15.27, G., Nil, Le Sec.

JANUARY 14th:

M.A., Breguet, F-CMAI, London-Paris, 12.05-14.15, G., Nil, Le Men.
M.A., Breguet, F-CMAD, London-Paris, 12.55-15.20, G.&M., Nil, Challoux
M.A., Spad, F-CMAV, London-Paris, 13.00-15.00, G., Nil, Le Sec.
S.N.E.T.A., DH4, O-BABI, Brussels-London, 12.20-14.40, G.M., Nil, Briere

JANUARY 15th:

S.N.E.T.A., DH4, O-BABI, London-Brussels, 13.10-15.20, G.M., Nil, Briere
M.A., Breguet, F-CMAH, Paris-London, 12.40-15.32, M., 3, Martel.
H.P.T., H.P., G-EATK, Paris-London, 14.00/14, 11.38, G., 1, Olley.

JANUARY 16th:

M.A., Breguet, F-CMAI, Paris-London, 10.55-13.45, G., Nil, Le Men.

### The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

JANUARY 10th:

H.P.T., H.P., G-EATK, Paris-London, 12.55 landed Lympne 14.55 (11/1/21), G.&M., 4, ——
S.N.E.T.A., DH4, O-BAIN, Brussels-London, 12.00, returned Brussels 14.35, G.&M., Nil, ——

JANUARY 11th:

NIL.

JANUARY 12th:

S.N.E.T.A., DH9, O-BELG, Brussels-London, 12.00-13.07, G.&M., Nil, ——
H.P.T., H.P., G-EATK, London-Paris, 12.05-16.20, G.&M., 6, ——

JANUARY 13th:

NIL.

JANUARY 14th:

H.P.T., HP, G-EATK, Paris-London, 14.00, landed Lympne 17.12, G., 1, ——
S.N.E.T.A., DH9, O-BELG, London-Brussels, 13.12-15.40, G.&M., Nil, ——

JANUARY 15th:

S.N.E.T.A., DH4, O-BABI, London-Brussels, 13.10-15.20, G.&M., Nil, ——

JANUARY 16th:

NIL.

### Air Port Statistics.

CONTINENTAL

| | | | |
|---|---|---|---|
| **Machines:** | | | |
| | Croydon 20 | Cricklewood 7 | Total 27 |
| **Personnel.**—Passengers: | | | |
| | Croydon 19 | Cricklewood 11 | Total 30 |
| Crews: | | | |
| | Croydon 22 | Cricklewood 10 | Total 32 |
| | | Total Personnel ...... | 62 |

### Inland Flying at Croydon.

Jan. 10th.—Nil.

Jan. 11th.—L.A.S., DH6 and Avro to Leatherhead (Muir); M.W.T.C., DH6, test (Lovell).

Jan. 12th.—P.L., Westland from Yeovil (Keep); A.P.B., Westland to Yeovil (McMullin); A.P.B., Westland, test (McMullin).

Jan. 13th.—P.L., Westland to Yeovil (Keep).

Jan. 14th.—L.A.S., Avro Leatherhead and return (Muir); H.P.T., Sopwith "Snipe" from Cricklewood (Foote).

Jan. 15th.—L.A.S., DH6, from Leatherhead and joy-riding (Muir); I.A.L., "Vimy," joy-riding (Barnard).

Jan. 16th.—L.A.S., Avro from Leatherhead and joy-riding (Muir); I.A.L., "Vimy," joy-riding (Barnard).

### Brooklands.

On Jan. 12th the huts, hangars, etc., formerly occupied by the R.A.F. at Brooklands were sold by auction by order of the Disposal Board, Ministry of Munitions. A good number of bidders were present and the total proceeds were £980. The firing shed and butts and a "flight shed" were included among the lots.

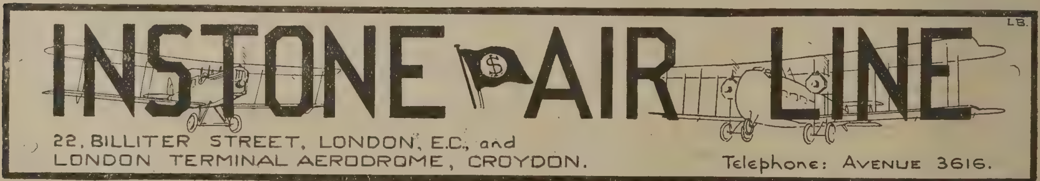
An interesting football match was played recently between Vickers House (Wesminster) and Vickers Ltd., Weybridge, on the ground of the latter club, who won by four goals to nil. The teams and friends were afterwards entertained to tea in the canteen, followed by a smoking-concert.

### Woking.

One is informed that a petition to "wind up" Martinsyde, Ltd., was presented on Jan. 11th, but was opposed and a new scheme of reconstruction outlined. There was also a suggestion of an issue of second debentures, but the motion was adjourned for a month to enable the company to complete their scheme.

The position of the firm is said to be much better, and only time is needed to permit a change for the better to be felt. Martinsyde, Ltd., have received large orders for motorcycles and sidecars as a result of their exhibition at Olympia and the many good performances of their machines.

As regards aviation, the position of the firm is practically "nothing doing," but the works could be turned onto building aeroplanes of standard type if there were sufficient orders. An official informed one that he considered aircraft building would soon be "a lost art" at Woking if orders for aeroplanes were not forthcoming.—J. F. S.



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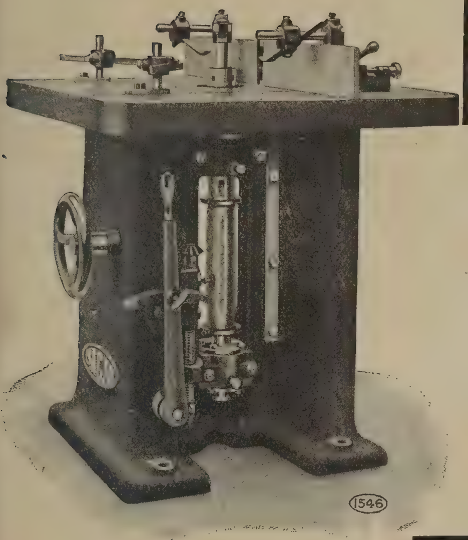

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# NAVAL AND MILITARY AERONAUTICS.

## GREAT BRITAIN.

### The Staff College, Camberley.

In an Army Order issued on January 12th, 1921, certain alterations are made in the list of officers nominated to attend the next course at the Staff College, Camberley, beginning on January 22nd, 1921. Among the additional officers selected to attend the Senior Division of the course are two R.A.F. officers :—Squadron Leader B. E. Sutton, D.S.O., O.B.E., M.C., and Squadron Leader D. C. S. Evill, D.S.C., A.F.C. The period of attendance in the Senior Course is one year.

Both these officers had careers of distinction in the R.F.C. and R.N.A.S. respectively, and later in the R.A.F.

### Royal Air Force Garrisons in Peace and War.

On January 12th, at the Royal United Services Institution, a paper on "The Use of the Air Force for Replacing Military Garrisons," by Group Captain J. A. Chamier, C.M.G., D.S.O., O.B.E., was read in that officer's absence by Wing Commander E. L. Gossage, D.S.O., M.C.

It has long been realised by those competent to judge that Royal Air Force units can be used extensively to reduce the numbers of the Army engaged in garrison duty abroad. Highly mobile, unaffected by the absence of roads, the Royal Air Force can maintain an effective influence over large tracts of country with scarcely a twentieth the number of men employed under existing conditions.

The lecturer quoted the case of Mesopotamia. Early in the past year six garrisons were maintained within a radius of 200 miles of Baghdad, and a division and a half of Indian troops had to be employed in their extrication. An aerial force could have guarded the entire area from Baghdad at a fraction of the actual cost.

In addition, had ten squadrons of the Royal Air Force been employed in Mesopotamia, the garrison of 47,000 troops and two squadrons R.A.F., costing £20,000,000, it would have been possible to reduce ground detachments to 7,900 all ranks and the cost to £10,000,000.

The lecturer was a little sceptical as to the possibility of the General Staff "thinking aerially," and said that they were shy of attempting anything new. One cannot agree with him. The General Staff realises the importance of aircraft in modern warfare, and understands quite well their use for garrison purposes. But at the same time the General Staff is presumably naturally unwilling to replace permanent garrisons by aerial detachments which on emergency could be taken away for other service as easily as they were originally stationed. "Festina lente" is a valuable axiom in warfare.

Major-General Sir W. S. Brancker, K.C.B., Colonel H. E. T. Kelley, Air Commodore Brooke-Popham, and Major-General Sir Neville Smith, V.C., all joined in the discussion which followed the paper.

### H.M.S. "Campania" to be Blown Up.

H.M.S. *Campania*, an old Cunarder equipped during the war as a seaplane-carrier, is to be blown up. She was rammed by a battleship in a gale in 1918 and sank off Burntisland Harbour and at present lies in the fairway of the Firth of Forth. It was commonly said during the war by those who lived on board her that *Campania* existed because of her many coats of paint, age having eliminated the rest of her structure. Therefore her sinking was not surprising.

Her name is chiefly known in the Aircraft Industry as having been used to designate a type of Fairey seaplane designed by Mr. Fairey to operate from this ship.

### Martlesham Heath Reunion Dinner.

A reunion dinner for officers of the Aeroplane Experimental Establishment, Martlesham Heath, will be held in London on Friday, Feb. 25th, 1921.

The time and place will be announced later.

Will any old members of the station please communicate with Capt. P. G. Robinson, Room A139, Air Ministry, London, W.C.2 ?

### No. XI Squadron, R.A.F.

A reunion dinner for officers of the above squadron will be held at Kettner's Restaurant (behind Palace Theatre) at 7.30 p.m., Friday, 28th instant. The price of the dinner will be 12s. 6d., exclusive of wines, etc.

Those wishing to attend are requested immediately to inform R. E. Dangerfield, Mount Avenue House, Ealing, W.5.

### Honours.

The London Gazette for Jan. 4th announces that the following decorations have been conferred by the Allied Powers on officers of the Royal Air Force for valuable services rendered during the War :—

BY THE EMPEROR OF JAPAN.

ORDER OF THE SACRED TREASURE (1st Class).

Air Marshal Sir H. M. Trenchard, Bt., K.C.B., D.S.O.

ORDER OF THE RISING SUN (2nd Class).

Maj.-Gen. Sir F. H. Sykes, G.B.E., K.C.B., C.M.G.

(3rd Class)

Col. E. H. Davidson, C.B.E., M.C.; Lt.-Col. A. C. Holms Maclean, C.B.E.

ORDER OF THE SACRED TREASURE (3rd Class).

Wing Cdr. B. R. White Beor, O.B.E.; Lt.-Cols. T. B. Phillips, O.B.E.; R. D. Waterhouse, C.M.G

ORDER OF THE RISING SUN (4th Class).

Sqdn. Ldrs. L. F. Forbes, M.C.; F. W. Stent. M.C.; Majs. G. G. Adeley, R. Chadwick, M.C., D.C.M.

5th Class.

Capts. W. H. J. Eldridge, F. G. Hogarth, R. R. Prentice, Lt. D. C. W. Sanders, A.F.C.

BY THE KING OF THE BELGIANS

ORDRE DE LA COURONNE (Officer).

Lt.-Col. T. B. Phillips, O.B.E.

## FROM "THE LONDON GAZETTE."

[NOTE.—*All the usual extracts from the "Gazette" have been held over owing to lack of space.*—ED.]

WAR OFFICE, Oct. 19th.

REGULAR FORCES.—CAVALRY.—11TH HRS.—Wing-Cmdr. H.R.H. Albert F. A. G., Duke of York, Earl of Inverness, K.G., R.A.F., Hon. Col. 4th Camn. Highrs., T.F., is apptd Col.-in-Chief.

ST. JAMES' PALACE, Nov. 2nd.

The King has given orders for the following appointment to the Order of the British Empire for services in connection with the war, to be dated Jan. 1st, 1920 :—

Ernest Cranston Given, Esq., Director of Airship Production, Admiralty.

AIR MINISTRY, Nov. 23rd.

The King has been pleased to approve of the undermentioned rewards to the officers named below in recognition of the valuable services rendered to aviation by their successful flight from England to Australia :—

AIR FORCE CROSS.

Lieut. Raymond John P. Parer, Aust.F.C.
Lieut. John Cowe McIntosh, Aust.F.C.

FOREIGN DECORATIONS.

Conferred by H.M. the King of Spain.

ORDER OF MILITARY MERIT.

Class III.—Wing.Cdr. William Dawson Beatty, C.B.E., A.F.C.

Class II.—Flight Lieut. Lionel Guy Stanhope Payne, M.C., A.F.C.

Class I.—Capt. Harris Holberton Square; Lieut. George Miller Jeffrey; Lieut. Anthony Conning Kilburn; Lieut. Ian Patrick Anderson; Lieut. George Murray, M.C.

The King has granted licence and authority to wear decorations above.

All the officers mentioned above, with the exception of Flight Lieut. Payne, have been demobilised

WAR OFFICE, Dec. 3rd.

The following is among the decorations and medals awarded by the Allied Powers at various dates to the British Forces for distinguished services rendered during the course of the campaign. The King has given unrestricted permission in all cases to wear the medal in question.

CONFERRED BY HIS MAJESTY THE KING OF RUMANIA.—*Croix de Virtute Militara, Second Class.*—740 Ch. Master Mch. A. Taylor, 3rd Sqdn. Aust. F.C.

AIR MINISTRY, Dec. 31st, 1920.

ROYAL AIR FORCE.—PROMOTIONS.—The following officers are promoted to ranks stated, with effect from Jan. 1st, except where otherwise noted :—

GENERAL LIST.—Group Capt. to be Air Commodore.—F. C. Halahan, C.M.G., D.S.O., M.V.O.

Wing Comdrs. to be Group Capts.—J. L. Forbes, O.B.E., A. G. Board, C.M.G., D.S.O., A. B. Burdett, D.S.O., J. A. Chamier, C.M.G., D.S.O., O.B.E., F. W. Bowhill, C.M.G., D.S.O.

Sqdn. Ldrs. to be Wing Comdrs.—E. L. Gossage, D.S.O., M.C., G. R. Bromet, D.S.O., O.B.E., N. G. Darnell, E. R. C. Nanson, D.S.C., A.F.C., F. K. Askins, D.S.C., S. Smith, D.S.O., A.F.C.

Flight Lts. to be Sqdn. Ldrs.—A. S. Morris, O.B.E., G. H. Bowman, D.S.O., M.C., D.F.C., W. R. Read, M.C., D.F.C., A.F.C., M. Henderson, D.S.O., G. W. Robarts, M.C., F. L. Robinson, D.S.O., M.C., L. L. MacLean, R. B. Maycock, O.B.E., K. R. Park, M.C., D.F.C., W. B. Callaway, A.F.C., D. G. Donald, D.F.C., A.F.C.

Flying and Observer Officers to be Flight Lts.—D. Gilley, D.F.C., A. S. Thompson, T. F. N. Gerrard, D.S.C., F. N. Hudson, M.C., H. G. White, B. E. Harrison, A.F.C., H. P. Lale, D.S.O., D.F.C., J. H. Green, W. H. Park, M.C., D.F.C., H. W. McKenna, D.C.M., W. B. Everton, D. Drover, A. L. Russell, C. B. Dick-Cleland, D. W. Grinnell-Milne, M.C., D.F.C., H. B. Russell, A.F.C., A. H. Goldie, H. O. Long, D.S.O., R. Gambier-Parry, C. H. Tancred, M.B.E., T. J. West, M.C., C. R. Keary, T. S. Ivens, T. C. Luke, M.C., R. C. Jenkins, M.C., L. H. Pakenham-Walsh, D.F.C., C. McM. Laing, M.C., A.F.C., F. H. Sims, A. W. Symington, M.C., A. J. Elliott, R. C. Preston, A.F.C., P. H. Cummings, D.F.C., K. H. Brown, D.F.C., G. H. Boyce, A.F.C., H. W. L. Saunders, M.C., D.F.C., M.M., C. T. Anderson, D.F.C., B. C. Adamson, J. T. Vernon, W. A. Coryton, M.V.O., C. Fenn.

MEDICAL BRANCH.—Wing Comdrs. to be Group Capts.—D. Munro, C.I.E., F.R.C.S. (E.) (with effect from Dec. 31st, 1920), N. J. Roche, O.B.E., H. V. Wells, C.B.E.

Sqdn Ldr. to be Wing Comdr.—J. MacGregor, M.C.; M.D.

Flight Lts. to be Sqdn. Ldrs.—T. J. Kelly, M.C., M.B., B.A., R. S. Overton

The following Flight Lts. are granted the hon. rank of Sqdn. Ldr. :—J. Keenan, J. N. Macdonald, J. Valerie, O.B.E., Jan. 1st.

STORES BRANCH.—Sqdn. Ldr. to be Wing Comdr.—C. G. Smith, O.B.E.

Flight Lts. to be Sqdn. Ldrs.—W. J. Waddington, O.B.E., L. Auker, O.B.E., R. W. Thomas, T. L. Stevens, G. E. Stagg, M.B.E., E. W. Havers, G. A. Hilliar, C. L. Archbold, J. Rylands, F. A. Baldwin, H. T. Foxen.

Flying Officers to be Flight Lts.—P. M. Brambleby, A. J. M. Ross, M.B.E., F. Grave, M.B.E., J. Roberts, H. V. Jerrard, A. R. Thomas, W. J. King, D.C.M., E. M. Cashmore, T. Bell, M.M., F. Petch, M.B.E., W. Thorne, J. Walker, A. J. Briddon, A. W. Smith, A. W. Turner, C. M. Bevan, H. W. Clarke, T. H. Evans, C. Harvey, W. C. Green, M.C., G. F. Law, D. Mitchell, H. P. Bridges, E. S. Baker, G. Oliver, W. R. Fairbairn, E. R. Webb, T. Surr, F. Anderson.

## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... ... *Front Cover & Inside Back Cover*
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Auster, Ltd. ... ... ... ... ... *Front Cover*
Beardmore Aero Engines, Ltd., The *Front Cover*
Beardmore, William, & Co., Ltd. ... ... *Inside Front Cover*
Bowden Brake Co., Ltd., The ... ... ... 76
Bray, Gibb & Co., Ltd. ... ... ... .. 75
Bristol Aeroplane Co., Ltd. ... ... ... 53
Coan, R. W. ... ... ... ... ... ... 75
Cunard Line ... ... ... ... ... ... 76
De Havilland Aircraft Co., Ltd., The... ... 69
Fairey Aviation Co., Ltd., The ... ... ... 57
Falcon Airscrew Co. ... ... ... 53
Firth, Thos., & Sons, Ltd. ... .. ... 70
Green Engine Co., Ltd. ... ... *Back Cover*
Hancock, James Lyne, Ltd. .. ... ... 76
Handley Page, Ltd. ... ... ... 70
Imray, Laurie, Norie & Wilson, Ltd. ... ... 76
Instone Air Line ... ... ... ... ... 72
MacLennan, John, & Co.... ... ... *Front Cover*
Martinsyde, Ltd. ... ... ... ... ... 58
Metal Airscrew Co., Ltd. ... ... ... *Front Cover*
Naylor Brothers, Ltd. ... ... ... ... 75
New Pegamoid, Ltd. ... ... ... ... 76
Nieuport and General Aircraft Co., Ltd. ... 69
Roe, A. V., & Co., Ltd. ... ... ... ... 54
Rolls-Royce, Ltd. ... ... ... ... ... 63
Rubery, Owen & Co. ... ... *Inside Back Cover*
Sagar, J., & Co., Ltd. ... ... ... ... 73
"Shell" Marketing Co. ... ... ... ... 61
Spencer, C. G., & Sons, ... ... ... ... 53
Supermarine Aviation Works, Ltd. ... *Back Cover*
Titanine, Ltd. ... ... ... *Front Cover & 67*
Vickers, Ltd.... ... ... ... ... ... 65
Wireless Press, Ltd. ... ... ... ... 75

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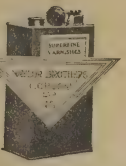

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JAN. 26, 1921.

# THE AEROPLANE

VOL. XX. No. 4.

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## OUR PROSPECTS IN 1921—II.

### The Subsidy Question.

Whether adequate finance for our air lines this year is to be had or not will depend largely on whether the few capitalists who believe in the future of aerial transport regard as any encouragement the paltry £60,000 for which the Air Ministry is asking the Treasury as the Civil Aviation Subsidy for 1921-22. If with the help of this subsidy the promoter of an air line can assure the financier that he will receive interest on his money even if the line itself shows a slight working loss, then it will be possible to find the money. But the promoter will have to provide the financier with figures as to working costs which are a trifle more convincing than most which have been produced in the past by aeronautical optimists, and are a trifle less depressing than those which Mr. White Smith produced at the Air Conference.

Personally one is all against subsidies as a matter of principle. But when we have a Government which is so perfectly imbecile as to subsidise a man for building a house over his own head, we may just as well extract some money from the Government for Civil Aviation.

### A Justification.

Also, under present conditions, it is morally right to extract subsidies from a reluctant Treasury. Last year it was right to refuse subsidies, which would only have been used to cocker-up badly managed or badly financed firms, such as those which have gone out of existence. Now that the sifting-out process is complete we must have new capital to build new businesses, if Civil Aviation is to be kept alive.

The ordinary stupid English business-man cannot even now see the need for air lines or for maintaining an Aircraft Industry. Therefore the money must be taken out of his pocket by the tax-gatherer and paid out again in the form of a subsidy to those young and intelligent men who are willing to finance air lines if they can secure a certain amount of guaranteed help from the Government.

That is to say, if the alleged business-man will not come into aviation as a shareholder (and small blame to him after such experiences as the Aircraft Mfg. Co. and the Whitehead affair), then he must be compelled to come in as a taxpayer.

### Our Post Office Imbeciles.

Of course, there would be no need for subsidies if we had a Postmaster-General who was gifted with even a rudimentary intelligence, for quite a number of air lines could be made to pay on the sums paid by the Post Office as subsidies to cross-Channel railway and shipping firms whose services take from four to five times as long as an air line would take and are, if anything, less reliable than a properly organised and capitalised air line would be. But, seeing that we have only an Illingworth instead of a Churchill with whom to deal in this matter, Air Transport must take the subsidies which are all wrong basically instead of earning its living honestly.

If the Post Office would simply send all its Continental mail and parcels post by air and would pay the air lines merely what it pays the railways and steamship lines at present, without any extra charge for aerial transport, the air lines would be glad to do the work at the price. The American Post Office began sending mails by air between New York and Washington, and found that it paid so well without any extra charge that to-day mails are being sent regularly between New York and San Francisco by air. Yet our imbecile Post Office has not the intelligence to follow America's lead.

Or, if the Post Office objects to being charged with lack of intelligence, then it can take it that it is being charged with deliberate dishonesty, in that if it is sufficiently intelligent to appreciate the benefits of aerial transport, the only explanation of its refusal to use the air lines for all its traffic is that there is a colossal piece of graft going on between the Post Office and some or other of the land or water transport firms which carry the mails with the help of exorbitant subsidies.

### An Opportunity at Malta.

Incidentally, those who believe in air lines enough to put up money for them provided they can see a certain return for the money should investigate the possibilities of an air line between Malta and Syracuse. The Maltese Government offers £16,000 as a subsidy for the conveyance of mails to and from Syracuse. The Italian steamship line which purveys one verminous boat each way per week charge £7 10s. for the single fare in the so-called first-class cabin. There are about five tons of mail matter, parcels, etc., to be transveyed per week. With a subsidy of about £300 per week, and a large number of passengers who would be glad to pay £5 a trip, a flying-boat line should do well.

### A Sound Principle.

One's personal attitude in this matter is absolutely in accord with that of Sir Hugh Trenchard, who said in his famous Minority Report last year that he disapproved of subsidies, but that if subsidies were to be paid they should be paid in the form of a percentage on the business done by the various air transport firms. This is a thoroughly sound principle.

The French method is a subsidy on miles covered, and so the greatest subsidy may be acquired by the firm which can force it pilots to cover the greatest distance on the cheapest and worst machines, without necessarily doing any genuine business at all. That is to say, the pilots and mechanics earn the subsidy for their employers who do nothing for it.

One gathers that this is to be altered this year to the extent of refusing to recognise as a "commercial" machine any aeroplane not built for the purpose. Hitherto any scrapped war machine could draw the subsidy. In fact, one has oneself seen an aged Bréguet complete with gun-ring staggering off on a subsidised voyage. But even as modified the mileage subsidy is wrong.

The British method—as proposed—is to pay a subsidy as a percentage on the money taken for freight and passengers' fares. This means that the owners of the line have to use their brains, if any, and have to work hard to get business. All the pilots have to do is to take the goods or passengers from place to place. Actual mileage is only a secondary consideration, in that the greater the distance the heavier the fares.

That is to say, if a ton of goods has to be conveyed between Paris and London, it would pay a French firm to split it up between five machines and claim a subsidy on about 1,200 miles flown, which would be economically wasteful. On the other hand, it would pay a British firm to pack the lot into one machine, and save operating expenses by using only one pilot for the job.

That simple example will serve to demonstrate that the British system is undoubtedly sound in principle, even though subsidies as a whole may be wrong.

### International Aviation.

The one reasonable argument in favour of subsidies is that they are necessary to keep our Aircraft Industry alive and to assure the progress of aircraft design until the Business Community awakes to the commercial value of air transport. If the Business Community had any intelligence there would be no need for subsidies, for the great business firms would themselves finance the progress of aircraft design. As it is, the British business man has no foresight and so the men with brains in the Air Ministry, like Mr. Churchill and Lord Londonderry, must induce the Government to pay for this progress.

Their argument in Parliament is that the Aircraft Industry is necessary to the future welfare of the Navy and Army. No member of the Government has yet had the intelligence or the nerve to stand up and plead that the Aircraft Industry is necessary to our commercial success in future. Such an argument will probably be produced by some intellectual Labour M.P., who is able to appreciate the fact that quick communication between nations is the best way of restoring prosperity to the World, and that the Commercial Aeroplane is the only true Dove of Peace.

### The German Situation.

Aeronautical progress must be international, if only because competition is good for trade, and the more progress is made by other countries the more we here shall be stirred to progress. The worst disservice that can be done to British Aviation is to attempt to hamper German Aviation, as seems to be the policy of that comic affair the Inter-Allied Aeronautical Commission in Germany.

For example, one gathers that the said Commission tried to stop the building of the four-engined Zeppelin-Staaken monoplane on the grounds that it could easily be transformed into a splendid bombing machine. The Commission evidently forgot that it would be useless as a bomber without a strong escort of fighting machines.

If this precious commission would confine its activities to preventing the production of fighting aeroplanes and would do its utmost to encourage the production of German commercial machines, then it would be doing a service to British Aviation. Nothing would do so much to spur our so-called business men into giving financial help to the Aircraft Industry as would the establishment of regular services of aeroplanes between Berlin and London via Cologne, and between Copenhagen, Amsterdam and London, operated entirely by German machines.

Therefore, in common with Lieut.-Col. Moore-Brabazon, M.P., the only public man who has had the pluck to express his private beliefs, one is all in favour of bringing Germany into the International Commission for Air Navigation, or I.C.A.N., which, as Col. Moore-Brabazon remarked in the debate on Dec. 20th, "corresponds to the Aerial Board of Control, visualised by Kipling in 'The Night Mail.' "

### The I.C.A.N.

To quote this distinguished officer, "There has been a mistake in this Convention (the International Air Convention) of mixing the whole thing up with the League of Nations. The Convention has nothing whatever to do with the League of Nations. It is a much more practical body than that. This I.C.A.N. has real power, not moral power only.

"Another thing I must criticise in this Convention with which we are dealing in this Bill is the conspiracy against our late enemies. There is an actual machinery in this Convention to prevent our late enemies coming into what is not a national or international Convention so much as a practical business-like arrangement between nations. We have it that no one who is a late enemy can come in until 1923, and even after that can only come in with a three-fourths majority. This is an arrangement which hurts us much more than it hurts Germany. . . . I do hope that in some way we will be able, first of all, to get the control of the World's aircraft right away from the League of Nations, and, secondly, to get our late enemies into it on a business and practical basis."

With this view everybody who is not blinded by that silly sentiment which so many English men and women mistake for patriotism will cordially agree. It takes the quick, practical, hard and unsentimental Irish mind to put the whole matter as concisely as Colonel Moore-Brabazon has put it. Of course, he was not reported in the newspapers, and, therefore, it is the more one's duty to place before the Aeronautical Community the first sound, common-sense views which have been set forth on this very important phase of international aviation.

### New Year Resolutions.

Let us therefore recognise the fact that Aviation is an International affair, and that the more we help other nations to succeed the more we shall succeed ourselves. Let us, in the year 1921, pay more attention than we have ever done to International flying. Let us send our machines to compete at the Monaco Meeting with those of France and Italy Let us send machines to Italy for the Schneider Cup Race. Let us, if possible, send machines to compete in the United States, as the U.S. sent machines to France for the Gordon-Bennett Race. Let us extend our air lines into Germany, and across Germany to Scandinavia. Let us set out to do sound business in the British Dominions Overseas, in South America, and in Asia.

We have wasted much time and money during the past two years over futile "missions" under incompetent management to various parts of the World. It is to be hoped that we have now learned useful lessons from these failures and that real business will be done in future. Let us therefore do our best in 1921 to develop International Aviation, for the more it progresses the greater will be the progress of British Aviation.—C. G. G.

## WHAT IS IT?

Under the heading "New Companies Registered" in the official list appears the following :—

> AIR EXPRESS, LTD. (172,693).—Private company. Registered Jan. 20th. Capital, £100 in £1 shares. To manage and work lines and services of aerial conveyances and craft of all kinds, manufacturers of aeroplanes, etc. The subscribers (each with one share) are : A. S. Walsh, 138, Canterbury Road, Leyton, E.10, managing clerk; F. Snelling, 89, Dovercourt Road, Dulwich, S.E., managing clerk.
>
> The subscribers are to appoint the first directors. Registered office : 27, Pall Mall, S.W.

It is of interest to note that 27, Pall Mall is the address of the Daimler Company, Ltd., which is allied with the B.S.A. Company, which is the proprietor of the Aircraft Mfg. Co., Ltd., which is the proprietor of Aircraft Transport and Travel, Ltd., which is in the hands of a receiver. Many would be interested to know what is the connection with this new company.

Perhaps there is no connection between it and the Daimler Company and the Daimler subsidiaries. On the other hand, it might pay very well to form a new company, call it Air Express, Ltd., and with it buy up the assets of Aircraft Transport and Travel, Ltd., for next to nothing, and so start afresh without the incumbrance of debts to the note-holders and others interested in the Aircraft Mfg. Co., Ltd., which have hitherto embarrassed A.T. and T., Ltd.

The career of this new firm will be watched with interest.

## THE KING OF THE BELGIANS VISITS PORTSMOUTH.

The King of the Belgians visited Portsmouth on Saturday, Jan. 22nd, and inspected H.M.S. *Temeraire*, on which his second son is serving as cadet. After leaving the ship King Albert made an inspection of the dockyard and then drove to Lee-on-Solent, from whence he flew to Dover in an R.A.F. flying-boat in order to catch the Ostend boat. The flight occupied an hour, the Royal flying-boat being escorted by two other machines.

## THE CRUISE OF THE ATLANTIC FLEET.

On Jan. 17th the Atlantic Fleet, under Admiral Sir Chas. Madden, left Portland for an extended cruise in Spanish waters. The Fleet includes H.M. Aircraft-Carrier *Argus*.

The cruise promises to be of exceptional interest, particularly with regard to aircraft. In addition to aircraft exercises, the squadrons will be engaged in fleet target practice. The places to be visited include Arosa Bay, Corunna, Vigo and Gibraltar. On the way down the Channel attacks were to be delivered by submarines and aircraft. The absurdity of taking only one solitary aircraft ship will be apparent to all maritime aviators.

## REWARDS FOR WAR INVENTIONS.

On Jan. 24th the first Report of the Royal Commission on Awards to Inventors, dealing with the proceedings from March, 1919, to July 31st, 1920, was issued as a White Paper (Cmd. 1,112). Among the 1,128 cases dealt with, the following are a few of the awards made in regard to aerial matters :—

| | |
|---|---|
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| Lieut. R. F. Power—aerial target | 2,34 |
| Dr. G. Prassone and Major Luigi Avorio—kite balloons | 4,50 |
| Sopwith Aviation Co., Ltd.—synchronising gear | 3,95 |
| Commander Brock (executor of)—Brock bullet (£7,000 also given by Admiralty.) | 5,00 |
| Messrs. Maréchal and Hervieu—K.B. and Hervieu sheds | 22,00 |
| Dr. E. Russell-Clarke (executrix of)—Improvements in wireless telegraphy and aircraft devices | 8,00 |
| The Blackburn Aeroplane and Motor Co., Ltd.—turnbuckles | 1,20 |
| Capt. W. O. Bentley—improvements in engines for aeroplanes (Br. 1 & 2) | 8,00 |
| Capt. Pratt—system of training aerial observers | 1,25 |
| Mr. E. T. Willows—improvements to kite balloons and aprons | 1,00 |
| Gwynnes, Ltd.—engines for aeroplanes | 110,37 |

This report will be dealt with at greater length when th White Paper has been examined in detail.

## UNEXPLAINED ACCIDENTS.

The following letter has been received :—

Sir,—*Re* Mr. D. F. Anderson's letter on "unexplaine crashes," it seems to me that the only way passengers ca interfere with elevator and aileron controls in a standard Avr is by placing their feet between the seat bearers and therefor on the controls which pass underneath the seats. The obviou remedy is to fit stout three-ply or five-ply wood over thi gap and so make it "foolproof."

The rudder controls, running alongside and close to th seat bearers, are not so prone to this interference, althoug passengers have been known to place their feet on thes as well.

(Signed) E. WEISER.

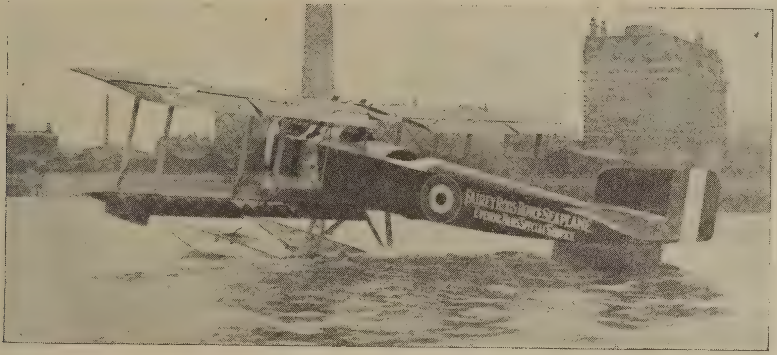
Colville Road, W., Jan. 21st, 1921.

# A NEWSPAPER SCOOP.

The ambition of every newspaper is to secure what is technically called a "scoop" over its contemporaries. A scoop consists in getting a piece of news, or a piece of inside information, before any competitor secures it.

"Scoops" are not confined to newspapers, though the word was used in this particular sense by newspapers before any other trade adopted it. In these days scoops are made by people of every sort. For example, it was distinctly a scoop to be the first to use the mighty Port of London as an aerodrome for a regular air service.

Here is seen the Fairey Seaplane (Rolls-Royce Engine) with which this scoop was made.



This machine was chartered by that enterprising paper the "Evening News," in June, 1919, o carry its products day by day from London to Margate. The pilot was Mr. Sidney Pickles, he well-known Australian aviator.

The machine used to fly from its shed up-river at Isleworth and alight between Waterloo Bridge and Blackfriars Bridge, practically alongside Carmelite House. There it used to take aboard ts cargo of the "Evening News," taxi down river and get off, according to the direction of the vind, below the Tower Bridge.

Day after day with remarkable regularity it delivered its cargo at Margate, with the result that he good dwellers in the Isle of Thanet received their afternoon news from London hours before eople much nearer Town, who had to depend on the old-fashioned railway for delivery.

Having proved its value and efficiency beyond dispute the service was discontinued merely ecause under the conditions then existing, the cost of operating an air service was too high to m t worth while for one newspaper to run it. But it proved another point, namely that the Port ondon (which is all the Thames below Teddington Lock, where the tide-way ends) is Londo est and most natural aerodrome.

Since then the Port of London Authority has been holding special committee meetings and sending epresentatives to investigate various types of hydro-aeroplanes to see whether other machines can e trusted onto their sacred waters to do what the Fairey Seaplane did successfully for weeks as far ack as June, 1919. There is, of course, no doubt about the Fairey, for it was the Fairey, as usual, vhich did the pioneer work of proving to the Port of London Authority that it possesses London's est aerodrome.

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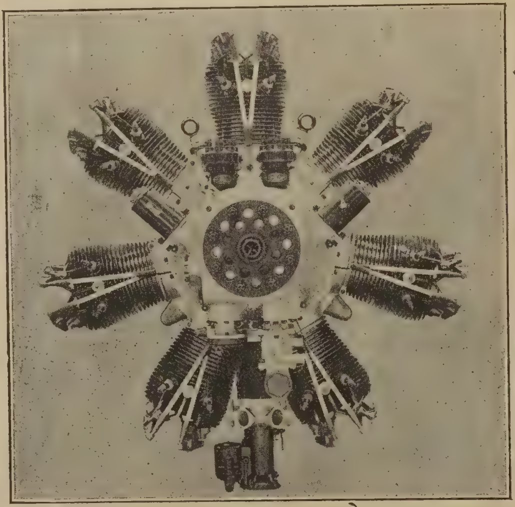

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INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS
AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

During last week the Daily Press became aware of the facts as to the Air Ministry's tenure of Martlesham Heath aerodrome which were first recorded in THE AEROPLANE of August 20th last. By a curious coincidence the note on the future of the Aeroplane Experimental Establishment which is published below was put into print for publication in this paper on the morning before the first notice on the subject appeared in a London evening paper.

An abstract of the paper by the Lord Montagu of Beaulieu read to the Royal Aeronautical Society and dealing with the cost of various forms of transport compared to that of air transport appears in this issue. The discussion was of considerable interest.

A very ingenious instrument for determining the drift of an aircraft and correcting the course in accordance therewith is described on page 86.

## THE FUTURE OF THE AEROPLANE EXPERIMENTAL STATION.

### A SUGGESTION.

At some time in the not very distant future the aerodrome at Martlesham Heath has to be returned to its owner, cleared of all aerodrome appurtenances, and the Aircraft Experimental Station will have to find a new home

As far as can be gathered numerous sites have been considered for the new establishment, all of them involving the building up of a new aerodrome, and the transplantation there of the personnel and equipment of the old establishment.

It, therefore, seems well to point out the advantage of combining the aeroplane and seaplane experimental establishments by removing the former to the existing station at the Isle of Grain.

On general principles it may be held that it would be well to maintain two separate and more or less competing experimental stations, in order that each may spur on the other to renewed activity. But as things now are, Martlesham has nothing to do with seaplanes, and Grain nothing to do with land machines, and the competitive nature of their activities is difficult to discover.

It may be pointed out that there does exist at Farnborough, in the form of the R.A.E., a full-size research establishment which could be used effectively to keep up the zeal of such a combined aeroplane and seaplane testing station as is now suggested, whereas the mutual interactions of the works of Grain and Martlesham as at present constituted are practically non-existent.

At the present moment Grain possesses sheds, workshops and living quarters with enough accommodation for all the work of the two Test Departments combined. It has a very fair aerodrome, and one which could be made amply large for the work of Martlesham at only a fraction of the cost of making a new aerodrome. The covering in of one large ditch and the acquisition of some not particularly valuable grazing land is all that is needed.

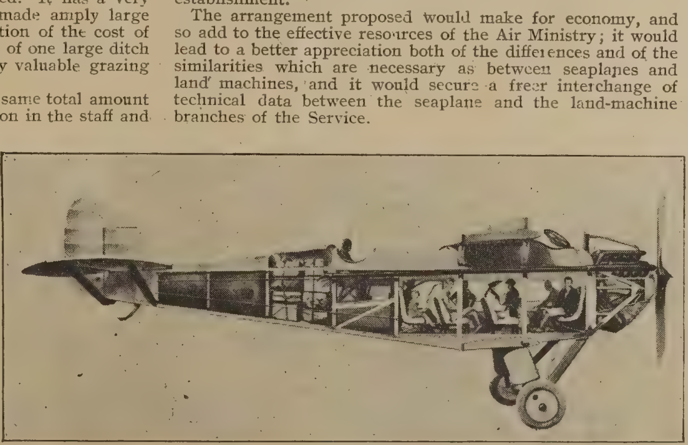
By combining the two establishments the same total amount of work could be got through with a reduction in the staff and personnel required, for in present conditions the minimum staff with which either station can carry on its work of accurately and reliably testing new aircraft is larger than can be continuously fully occupied by the present flow of new aircraft for test. Hence the fusion would at least set free a certain number of extremely capable technical officers—a type sadly uncommon in the R.A.F. at present, and one for which that Service has many uses.

Also the concentration at the one experimental station of both water and land aircraft will have distinct advantages. Seaplanes have suffered in the past from having been treated as a separate class of flying machine. Their designers and builders have been considered as inferior beings, their machines have not been expected to compare in performances with the land type, and in consequence their design has in some respects fallen behind that of land machines.

On the other hand, seaplane designers in their efforts to overcome difficulties inseparable from the conditions of seaplane work have developed methods of construction and details of design which may have their uses in connection with land machines.

Both land machines and seaplanes are, in the end, destined to take the air, and although the conditions of their operation are sufficiently different to justify individual designers specialising upon one or other type, they are sufficiently alike for it to be desirable that the work of specialists in the two branches of design should be compared upon as nearly as possible equal terms, by the same methods and by the same establishment.

The arrangement proposed would make for economy, and so add to the effective resources of the Air Ministry; it would lead to a better appreciation both of the differences and of the similarities which are necessary as between seaplanes and land machines, and it would secure a freer interchange of technical data between the seaplane and the land-machine branches of the Service.



**HOW AIR TRAFFIC IS CARRIED.—A sectional view of the D.H.18 which it is claimed is the most economical transport aeroplane yet in existence. From right to left are the engine compartment, the cabin with seats for eight passengers, the pilot's compartment, a light baggage compartment, and, in the last two bays before the tail, flotation bags.**

# THE COST OF AIR-TON MILES.

At the meeting of the Royal Aeronautical Society held on the afternoon of Thursday, Jan. 20th, Lord Montagu of Beaulieu attempted a comparison between the cost of transport by air and by other existing standard methods.

In the opening paragraphs the author emphasised that a comparison on the basis of cost per ton-mile was necessarily an incomplete comparison.

The speed of transport enters into the question, firstly because in any method of transport increased speed means increased cost, and secondly because in return for the increased cost of high speed one obtains a saving of the time wasted by slower methods. Also the author might have added that, although a particular method of transport may show a very low cost per ton-mile, it may involve the use of a very long route and therefore a high cost for transport of a ton from point to point.

Coming to the subject of the actual cost of existing forms of transport, Lord Montagu put the cost per ton-mile of road motor-transport at from 7d to 10d. per ton-mile, of motor-'bus and char-a-bancs at about 1s. 8d. per ton or 1¼d. per passenger mile, of railways at 2½d. per ton-mile

The cost of shipping per ton-mile is so low and the ton-mileage is so difficult to discover that shipping is treated on the basis of gross tonnage of ship and cargo combined, and varies between 0.038d. and 0.072d. per ton-mile. The cost of passenger traffic per ship-mile varies between 1.11d. and 1.8d. per passenger-mile.

For the aeroplane the author estimates that 44d. per ton-mile would afford a reasonable profit, and that therefore the aeroplane can only compete with existing facilities where speed is of great value.

In the case of airships, the cost of R.34's trip to America is stated to have been 23s. 6d per ship-mile. Air-Commodore Maitland's estimate for the England-to-India trip with a similar ship is 41s. 5d. per mile, including interest on capital and cost of running both ship and the necessary bases. With 15 tons available for useful load, this gives 35½d. per ton-mile.

Allowing a reasonable amount of luggage, there is derived from this figure a set of estimated passenger fares to Egypt, India, South Africa and Australia which compare very favourably with the first-class steamer fare for the same journey.

The final conclusion is that the cost per ton-mile of various forms of transport affords only an incomplete comparison of their utility.

Air transport is not yet cheap and will have to fight for its life for some time to come. Its chief value is its speed, and the services now in existence do not allow of a saving of time sufficiently great to compensate for the high cost. Over really long-distance routes this saving due to speed will operate more effectively, and for such long distances the airship will serve better than the aeroplane.

Finally, the political importance of transport facilities is commented on. Lack of roads is a sign of a low form of civilisation. Bad communications render government impossible.

## The Discussion.

**The Chairman** (Lord Weir of Eastwood) said that the paper tended to clarify the commercial aspect of air transport, and he thought Lord Montagu had succeeded admirably in his object, which he (Lord Weir) imagined to be to put the position of air transport as a commercial proposition in its true light.

At the present moment, on figures for cost, aviation did not show up well. But it must be remembered that exceptional performance commanded exceptional returns, as instance the *Lusitania*, which before the war was kept full of passengers at a very high rate. Another instance was the German South American steamer service, which charged and obtained a very high premium for providing travel facilities of the most luxurious type.

He was particularly glad that the author had insisted upon the fact that aviation as a commercial enterprise must stand on its own merits. He personally held that there were good reasons why subsidies should be granted for the purpose of encouraging the initiation of commercial air services, and he was glad that the Government had adopted the principles of the Report of the Committee on Civil Aerial Transport. Unfortunately, immense harm had resulted from the delay in starting the subsidies.

An important feature of the present time, mentioned by Lord Montagu, was the increasing importance of the cost of labour in the various transport services now at work. He thought that this must eventually react on the organisation of such concerns as railways, who would find means of improving their efficiency to counteract this increase, and that no very large flow of traffic from rail to road would be found to be permanent.

He would like to be able to speak more optimistically of the immediate future of aviation. Results so far obtained were promising, but the present financial conditions were against new developments. Stability and confidence would in time return, and then aviation would come into its own.

**Mr. H. White Smith** said that Lord Montagu had incorrectly quoted one of his figures—28d. per aeroplane mile—as an operating cost. This should be 38d.—practically the same as Lord Montagu's own figure. The author had raised the question of "origin to destination" transport. It was not often realised how much handling was required in many journeys. Goods went by motor-lorry to a station, by train to a port, by ship to another port, by rail inland, and then were delivered by road. The cost of such handling was very great, and aerial transport held prospects of a considerable saving in this respect.

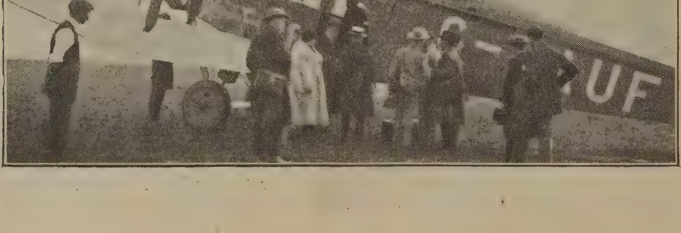
Air transport costs would have to come down, but he had no doubt they would. In fact, they were coming down and would continue to do so, while all other forms of transport were becoming more costly.

**Mr. F. Handley Page** wished to endorse the importance of keeping air transport free from a dependence on Government assistance. An enterprise so assisted could never yield big returns without becoming the object of a campaign for nationalisation. The cost of running air services did not stop at those of having the machines and flying them from point to point. One had in addition the cost of convassing the sale of air transport. Few people knew how many factors entered into the operation of such services. The purely commercial side was important—and expensive. He instanced the case of a parcel sent from Paris on the cash-on-delivery basis. After its arrival it took two or three days to collect the cheque from the consignee, who remarked that if that was the quickest way of delivering goods now available he would have all his parcels sent by wheelbarrow.

He had noticed in a recent issue of the *Engineer* a statement by one who claimed to be a pioneer of aviation that it was the risk of accident which stopped passengers using air transport. As everyone knew, they had recently had the misfortune to suffer a serious accident on the H.P. service. That accident had not reduced the number of passengers in the least

Costs must come down for the traffic to increase. The aeroplane was susceptible of more improvement than any other vehicle. Larger loads could be carried for fewer horse-power on less expensive and more robust machines than now existed, and the present time was available for producing such machines. The problem was one for the designer.

On the subject of airships he would like to know what was the life of a rigid airship. If some accounts were true the



**A MODERN EXPRESS PASSENGER-CARRIER.—A D.H.18, shown in section on the previous page, is here seen with a group of passengers about to embark. The figures given by Lord Montagu for the cost of aeroplane transport of passengers in the paper abstracted above were based on the results obtained with this type of machine.**

# NAPIER

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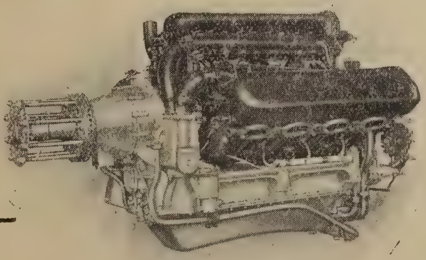

Atlantic voyage had nearly terminated that of R.34. If it was true that the capital cost of airships was so high, would it not be more economical to spend public money on encouraging aeroplane design than on running experimental airships?

**Col. Ogilvie** said that it seemed very difficult to arrive at the cost of building airships. We had only built them in ones. Information as to the cost of the series-built Zeppelins would be valuable and would probably show that an airship could be built much cheaper than was usually supposed.

It was very remarkable how much power was wasted at high speeds by present aeroplanes. The power absorbed driving the wings of an aeroplane could be halved if the landing speed necessary did not call for big surfaces. An undercarriage was no use when one was flying, and it absorbed much power. Existing fuselages took about four times as much power at a given speed as the best shaped body of equal dimensions. All these offered possibilities of improvement, and therefore costs could and would be reduced.

**Sir Chas. Bright** said that he was not competent to discuss the details of this very interesting paper, but he thought that it was urgent that every effort be made to get civil aviation going in lands where roads and railways were scarce, and where the aeroplane was free from competition.

**Lord Montagu**, replying, thanked the audience for their appreciation of his efforts. He apologised for the error in transcribing Mr. White Smith's figure. As to the cost of airships, he had only statements made by Col. Maitland, but probably costs would be less if manufacture in quantity occurred. He believed that, apart from accidents, the frame of a rigid suffered no discoverable deterioration. Outer covers had a life of one and gas bags of two years or so.

He regretted his inability to give shipping costs per ton-mile of cargo, but shippers could only supply data for ton-miles of ship plus cargo.

The proceedings terminated with the usual votes of thanks to the author, proposed by Mr. White Smith, and to the Chairman, proposed by Col. Ogilvie.

## A NEW NAVIGATION INSTRUMENT.

*L'Aéronautique* for December, 1920, contains a description of certain aerial navigation instruments devised by M. Le Prieur, destined to facilitate correction for drift, written by the inventor.

In his introductory remarks M. Le Prieur draws attention to the difficulties usually encountered in the ordinary methods of estimating drift by observing the apparent course of fixed objects on the ground, affected by rocking and pitching of the machine, and by gustiness of the wind, and points out that what is required is an instrument giving the mean drift taken over an appreciable interval.

To obtain the desired result he has devised the instrument known as the "Dérivographe."

This consists of a sighting tube fitted with hair line indices mounted upon one side and a slideable pencil carried by the other side of a parallel link motion. The device is shown diagrammatically in Fig. 1. On the base of the instrument there is fixed a ruled card ruled with lines parallel to the longitudinal axis of the machine.

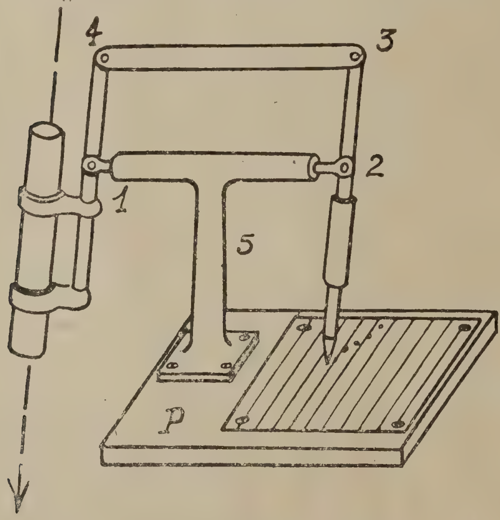

Fig. 1.

A suitable fixed object having been selected, it is brought to coincidence with the index marks of the sight, and the pencil is slid down to make a dot on the paper. This process is repeated nine or ten times, and gives a row of dots showing the apparent path of the object, and a very close estimate of the mean angle of drift is thus obtainable.

To use the results obtained from the "Dérivographe" M. Le Prieur has devised the course correctors shown in Fig. 2. This is designed for use in machines where navigation and pilotage are attended to by two individuals.

On the base board 1 there is mounted a rotatable disc with a toothed edge 2, engraved with the points of the compass. On this disc a further disc 4 is mounted, this latter being frictionally held to the disc 2. A paper square 5, ruled with parallel lines, is clipped over the disc 4 by a ring 6, which grips the corners of the paper. The paper is held so that the lines are parallel to the index line 7 on the upper disc.

Pivoted upon the base plate at a point 15 there is a ruler, the upper part of which 18 has its edge a continuation of a wire index in a gap in the lower half of the pivoted member. This wire index passes over the base of the "Dérivographe," which slides across the base 1 in guides 23 and 24.

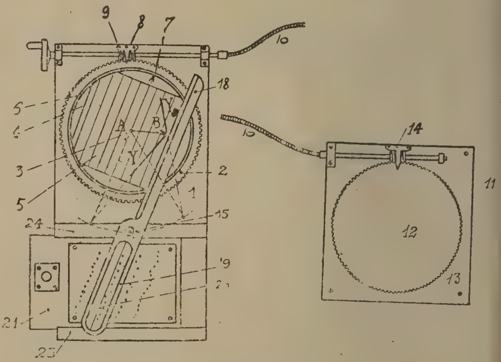

Fig. 2.

The disc 2 is coupled by the worm 9, and flexible shaft 10 to a repeater disc 12 put by the compass, and the pilot's business is to keep the compass needle always at the point indicated by the repeater.

Therefore the index lines 7 on the disc is always kept pointing in the direction of course required to be made good.

The method of using the instrument is as follows:—The index mark 7 on the upper disc is brought to the compass point corresponding to the desired course, and this point is brought to correspond with the index finger 8 by rotating the lower disc and with it the upper one carrying the ruled paper. The "Dérivographe" is then used to determine the apparent path of any convenient fixed point, and the wire 18 on the pivoted straight edge is brought to coincide with the mean angle of this path by sighting the row of dots directly through the space in the ruler. A line Y is then drawn along the paper 5 using the straightedge 18.

Course is then changed through a fairly large angle and a fresh drift angle is obtained, and a further line $Y^1$ is drawn to correspond. These lines Y and $Y^1$ must be sufficiently long to cut at B. Then to the scale at which the distance from the centre 15 of the ruler to the centre of the disc (3 or A) represents the air speed of the machine; the distance A B represents the wind velocity.

If then the discs are rotated by the worm till the lines on the paper 5 and the straightedge 18 are parallel one to another, and the point B just touches the straightedge, the pilot's indicator gives him the compass bearing to make good the required course. As long as the correct course is made good, observations on the "Dérivographe" will continue to give traces parallel to the sight-wire 19. A divergence means a change of wind and calls for a fresh determination of the course.

## THE BRITISH SPEED RECORD.

Owing to some inexplicable error in transcription, the Review of the Year 1920 (second six months) which appeared in The Aeroplane on Jan. 12th omitted to mention the creation of the existing British speed record. This record was made at Martlesham Heath on July 17th, 1920, by the Nieuport "Goshawk" (300-h.p. A.B.C "Dragonfly" engine) piloted by Mr. R. L. Tait Cox. The speed recorded was 167.5 m.p.h., this beating the record of 161½ m.p.h. put up by Mr. Raynham on the Martinsyde "Semiquaver."

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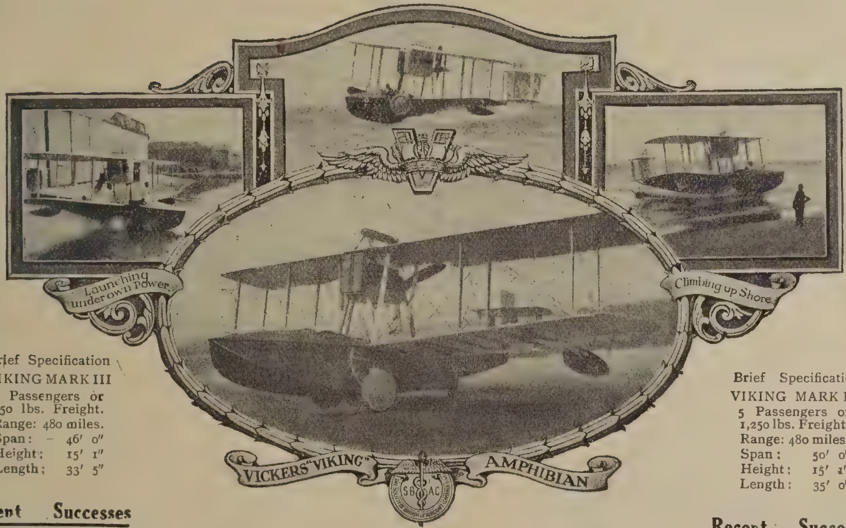

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The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

1. Shortest time in "unsticking" from water.
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## AERONAUTICAL MAPS.

A paper on International Aeronautical Maps was read by Lieut.-Col. E. F. W. Lees, D.S.O., before the Royal Geographical Society on Jan. 17th last.

At the International Aeronautical Conference it was decided that the subscribing Powers should through their Air Ministries or equivalent departments discuss the standardisation of aeronautical maps. A certain measure of agreement has been reached, and the lecturer described the present position.

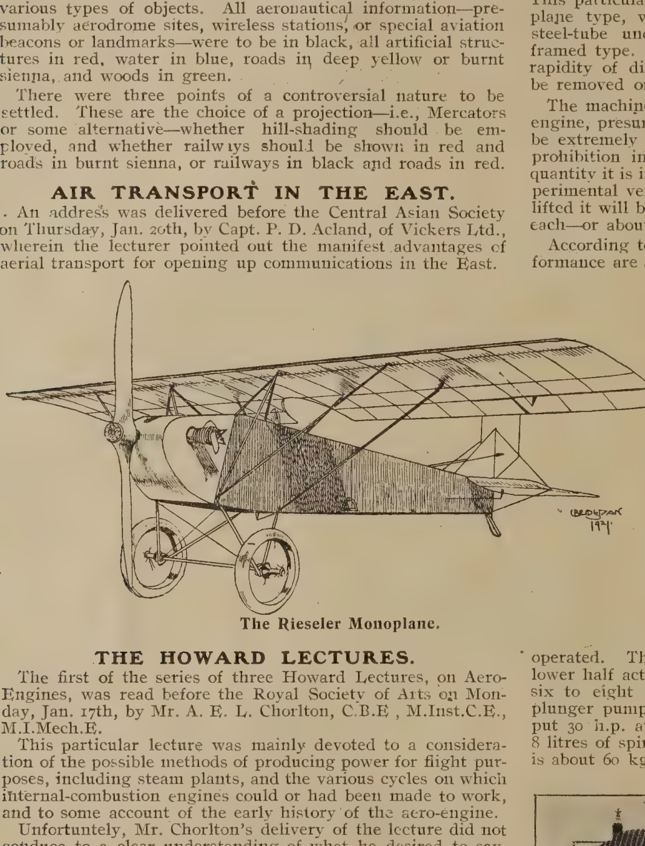
Col. Lees said that the amount of detail which should be shown on aeronautical maps should only be limited by the necessity for avoiding overcrowding. The exact position and shape of all ground features, such as railways, roads, rivers, towns, must be shown as far as the scale permitted, so that a fleeting glimpse of the ground should enable a pilot to locate himself as accurately as possible.

Clear distinction between various features was essential. For this purpose it was proposed that standard aeronautical maps should be printed on a pale-green or yellow ground, and that distinguishing colours should be employed for various types of objects. All aeronautical information—presumably aerodrome sites, wireless stations, or special aviation beacons or landmarks—were to be in black, all artificial structures in red, water in blue, roads in deep yellow or burnt sienna, and woods in green.

There were three points of a controversial nature to be settled. These are the choice of a projection—i.e., Mercators or some alternative—whether hill-shading should be employed, and whether railways should be shown in red and roads in burnt sienna, or railways in black and roads in red.

## AIR TRANSPORT IN THE EAST.

An address was delivered before the Central Asian Society on Thursday, Jan. 20th, by Capt. P. D. Acland, of Vickers Ltd., wherein the lecturer pointed out the manifest advantages of aerial transport for opening up communications in the East.



The Rieseler Monoplane.

## THE HOWARD LECTURES.

The first of the series of three Howard Lectures, on Aero-Engines, was read before the Royal Society of Arts on Monday, Jan. 17th, by Mr. A. E. L. Chorlton, C.B.E., M.Inst.C.E., M.I.Mech.E.

This particular lecture was mainly devoted to a consideration of the possible methods of producing power for flight purposes, including steam plants, and the various cycles on which internal-combustion engines could or had been made to work, and to some account of the early history of the aero-engine.

Unfortuntely, Mr. Chorlton's delivery of the lecture did not conduce to a clear understanding of what he desired to say, and the historical part of the lecture was very incomplete and by no means entirely accurate.

## MORE SOARING THEORIES.

The flight of birds has again become a subject of earnest discussion in this as in other countries. The notes by Capt. Wildeblood and their sequelæ which have appeared in this paper instance the fact as far as this country is concerned.

The gliding and soaring competitions held in Germany during the past summer prove that our late enemies have given the subject their consideration, and the French aeronautical journals have recently devoted much space to the subject.

And now Col. R. de Villamil (late R.E.) has published a 48-page pamphlet wherein he claims to have solved the whole mystery.

Unfortunately his explanation is nothing more than the ancient one that flying down wind a bird acquires the kinetic energy due to the sum of wind plus flight speeds, and turning up wind requires only the energy due to flight speed minus wind speed, and that he has the difference of energy available to lift him.

It is difficult to understand why Col. Villamil should worry about mere wind speeds. Imagine a 1lb. bird with a flight speed of 20 m.p.h. flying in still air on the equator from W. to E. The earth's velocity of rotation is roughly 1,000 m.p.h. at the equator—which gives 1,020 m.p.h. as the bird's true speed, and $\frac{1 \times (1020 \times 1.46^2}{2g} = 34{,}642$ ft.-lbs is his kinetic energy. Turning round and flying E. to W. his speed drops to 980 m.p.h., and his K.E. is $\frac{1 \times (980 \times 1.46,^2}{2g} = 31{,}996$ ft.-lbs. The difference, 2,646 ft.-lbs., according to Col. de Villamil, should be available to lift him, and would suffice to elevate him a trifle of 2,646 ft.—which should satisfy any bird.

## THE RIESELER MONOPLANE.

The Rieseler monoplane shown in the attached sketch belongs to the cheap, low-powered single-seater class which seems to have achieved popularity in every country but this. Successful tests have been made recently at Johannisthal. This particular specimen is of the rigid truss parasol monoplane type, with a fuselage of steel tube construction, a steel-tube undercarriage, and wings of the normal wood-framed type. Special attention has been given to ease and rapidity of dismantling, and it is said that the wings can be removed or replaced in 10 minutes.

The machine is fitted with a two-cylinder Haacke air-cooled engine, presumably of about 35 h.p. The machine is said to be extremely manœuvrable and easy to land. Owing to the prohibition in Germany of the manufacture of engines in quantity it is impossible to build this machine except in an experimental version, but it is estimated that when the ban is lifted it will be possible to sell the type at about 30,000 marks each—or about £125 in English money.

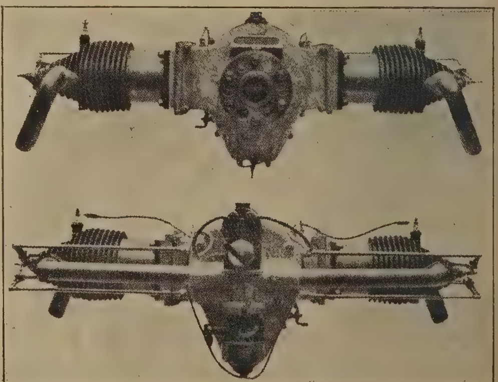
According to *Flugsport*, the main dimensions and the performance are as follows :—

SPECIFICATION OF THE RIESELER MONOPLANE.

| | |
|---|---|
| Span | 7.06 m. |
| Length | 5.04 m. |
| Wing surface | 11.4 sq. m. |
| Weight empty | 165 kg. |
| Weight loaded | 230 kg. |
| Loading | 20 kg. per sq. m. |
| Power loading | 7.7 kg. per h.p. |
| Fuel capacity | 45 lit. |
| Oil capacity | 2.5 lit. |
| Range | 575-650 km. |
| Max. speed | 95 k.p.h. |
| Cruising speed | 75 k.p.h. |
| Landing speed | 40 k.p.h. |
| Climb to 1,000 m. | 4 min. |

THE HAACKE ENGINE.

This engine, fitted successfully to the Rieseler monoplane, is of the two-cylinder opposed air-cooled type. Cylinders are semi-steel castings, fitted with overhead valves, push-rod operated. The crankcase is an aluminium casting, whose lower half acts as an oil reservoir carrying sufficient oil for six to eight hours' run. Lubrication is effected by two plunger pumps. The bore is 120 mm., stroke 140 mm., output 30 h.p. at 1,300 r.p.m. The consumption is said to be 8 litres of spirit and 0.300 kg. of oil per hour, and the weight is about 60 kg.



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# TORPEDO-CARRIERS VERSUS BIG SHIPS.

The material embodied in the following notes has been received from the Blackburn Company :—

In the recent controversy on the trend of Naval development widely divergent views have been expressed. Some eminent authorities have asserted that all large surface-craft should be abandoned owing to their vulnerability to torpedo attack, while others maintain that large ships can be built, doubtless at considerable extra cost, to withstand safely torpedo attack. It would appear, however, that these in their turn would be endangered by the advent of larger torpedoes carrying a heavier explosive charge.

In no case has the value of the torpedo as a weapon been questioned, and it is interesting therefore to consider the advantages which are claimed for aircraft over the other means which may be employed for delivering a torpedo attack—namely, small high-speed surface-craft (ranging from motor-boats to destroyers) and submarines.

### Surprise in Attack.

In attacking with the torpedo, as in all forms of attack, the element of surprise is of the utmost value. For this reason the submarine has an advantage over surface-craft in that it can approach close to its objective with little chance of detection until within short torpedo range. It pays a heavy price, however, for this advantage in its lack of speed and manœuvrability. Its lack of speed confines its operations largely to lying in wait for enemy ships, and if its presence is detected its poor manœuvrability gives the enemy a good chance of avoiding the torpedo by rapid changes of course.

Surprise can rarely enter into an attack by surface-craft. An approaching destroyer would be visible to the enemy in fairly clear weather for at least ten minutes before getting within extreme torpedo range, and, except in the case of opposing ships steaming towards one another, for a longer period.

Torpedo-planes flying at upwards of 10,000 ft. can begin to glide with engine off, and therefore silently, some ten miles away, remaining invisible until within three or four miles, and probably undetected until much closer. Gliding at, say, 120 knots, it is unlikely they would be seen more than a minute before launching a torpedo at close range.

Thus the torpedo-plane shares with the submarine the advantage of getting to close range unobserved. But on the score of speed and manœuvrability it is not merely not inferior to its target, but has about four times the speed of a fast ship and can turn in a time measured in seconds as compared with minutes. Moreover, with a fraction of the personnel of one submarine, a whole squadron of torpedo-planes can be provided to converge from all points of the compass and so render manœuvres such as change of course almost useless.

This facility in getting to close range has not only the advantage of surprise, but also implies a much higher percentage of hits than can be hoped for with surface-craft. When torpedoes are launched at a range of several miles it is necessary, in order to score a hit, to estimate correctly the speed and course which the target will maintain or take up some five minutes after the torpedo is discharged, and as change of course is commonly resorted to when a ship is attacked by torpedo the percentage of hits to be expected is comparatively small.

### The Question of Cost.

From the point of view of cost, both as regards personnel and material, aircraft can claim a marked advantage. A flotilla of destroyers costing £300,000 or £400,000 each, and carrying 70 or 80 men each, would only in a heavy engagement average 10 torpedoes discharged per ship. This would imply some seven or eight men and thirty or forty thousand pounds' worth of material employed and endangered for each torpedo fired.

In the case of aircraft there is only one man and a machine costing about five thousand pounds engaged for each torpedo fired.

The implied assumption that each torpedo-plane risked has an opportunity of discharging its torpedo is justified because it is not visible, and therefore not endangered, until within striking distance; moreover, every ship sighted, or whose position is signalled by wireless, presents an opportunity to a machine having a speed some 70 or 80 knots superior to that of any ship.

On the score of comparative results for the same cost it is interesting to imagine what would have happened if in the battle of Jutland our destroyers had been replaced by torpedo-carrying aircraft of the same monetary value, some part of the Ships of the Line being used as carriers.

If there were a hundred destroyers employed, costing, say, thirty-five million pounds, with crews aggregating 7,000 men, torpedo-planes could have been provided to the number of 7,000, which represents not less than 30 torpedo-planes to every ship in the German Fleet. The cost would have been the same and the number of men endangered would have been the same, but whether any German ship would have returned to its harbour is another question.

As an illustration of the value of speed in torpedo work it may be remarked that had this country been supplied with torpedo aircraft, as they now exist, at the time of the German Naval raids on the East Coast, it would have been possible to give the Germans three hours' start on their return journey and still overtake them with torpedoes within an hour.

It has also to be borne in mind that at no time is an enemy fleet safe from attack by torpedo-planes. While a fleet may be protected from an attack by surface-craft and submarines by being anchored in sheltered waters the entrance to which is guarded by nets, mines, and shore defences, such devices are no bar to aircraft, and while anti-aircraft guns may be installed and fighter aircraft be sent up in opposition, these cannot be counted upon to stop more than a fraction of an attacking force.

### A Record of Experience.

For several years the Blackburn Company have specialised on torpedo aircraft and have in fact built the whole of the machines of this class now in use in the British Service. The design of these machines originated, as did so many excellent war machines, with Messrs. Sopwith, but was handed over to Messrs. Blackburn's to put into production.

Messrs. Blackburn's faith in the future of torpedo aircraft and their experience in the production of so many machines of this type naturally led to a desire on their part to produce a new machine incorporating all the improvements which had gradually been introduced in previous machines and including several bold steps forward as regards general lay-out and construction. This machine (the "Swift"), which has been built and recently tested at their works at Brough, East Yorks., has completely fulfilled the firm's expectations. The torpedo carried is larger than in machines previously in service, the speed is greater, the rate of climb is better, and the ceiling higher. The engine employed to make this improved performance possible is the Napier "Lion," which, on account of its light weight per horse-power, coupled with smooth and reliable running, is being so widely used in the present-day development of aircraft.

The following are the main particulars of the machine :—

| | | | |
|---|---|---|---|
| Span | 48 ft. 6 in. | Total weight | 6,300 lb. |
| Overall length, | 34 ft. 10 in. | Maximum speed | 100 knots |
| Height | 12 ft. 3 in. | Minimum speed | 45 knots |

The Passenger Entrance on the Zeppelin Staaken Giant Monoplane. The nose folds back like a door, as shown.

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# NOTES FROM ABROAD.

## Intelligent Interest.

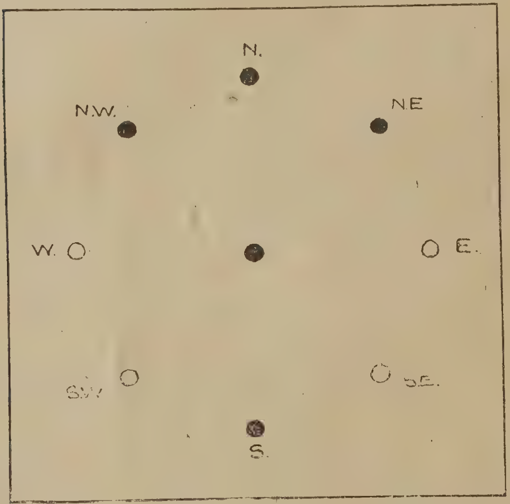
The Society of Automotive Engineers, which is the most important of American societies for engineers concerned with internal-combustion and transport work, has very wisely devoted attention to aviation and has held this year two aviation meetings, at both of which Mr. Glenn L. Martin presided. The papers read at the first meeting were composed by Major Thurman H. Bane, of McCook Field ("Progress in Military Aviation"), Grover C. Loening ("Design Requirements of Commercial Aviation"), C. D. Hanscom ("Airplane Wings"), and F. W. Caldwell ("Airplane Propellers").

At the second meeting, devoted to commercial aviation, Prof. Edward P. Warner, of the National Advisory Committee for Aeronautics, recently returned from a trip abroad, discoursed on "Commercial Aviation in Europe," and Ralph H. Upson read a paper on "Transportation of the Immediate Future." It is noteworthy that these aeronautical meetings replace the annual aeronautical meeting and dinner heretofore held at the time of the New York Aero Show. This replacement was due to the fact that there will not be an Aero Show in New York in 1921.

## A German Landing Light Scheme.

In the German weekly *Illustrierte Flugwelt* of Nov. 24th last there was given a description of a wind-direction indicator for night landing designed by the German firm, Julius Pintsch A.G., of Berlin.

The aerodrome is provided with nine sunk lights carried in boxes with glazed tops flush with the ground. Of these nine lights, eight are arranged at equidistant points on the circumference of a circle, one light each at points corresponding to N. N.E., E., S.E., S., S.W., W., and N.W. The ninth is at the centre of the circle.



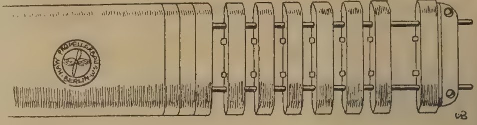
Of these nine lights, five only are alight at any one time, three of these being adjacent lights on the circumference, one the centre light, and the last that diametrically opposite to the central one of the three first mentioned. These lights thus form the outline of an arrow, and indicate the direction in which a machine must land to face into the wind.

The switches controlling the lights are operated automatically by a wind vane mounted in any convenient position, and thus need no attention to maintain a correct indication.

## The Haw Airscrew.

A curious form of airscrew construction is that due to Engineer Haw, of the Haw Propeller-Bau-Compagnie, of Berlin. This consists of a central steel boss whereinto are fixed two tapering steel skeleton blades. These blades are dovetailed into the central boss, which only needs tightening up on the engine shaft taper to lock the blade skeletons securely into place. Onto the skeleton steel blades are slipped a series of properly profiled wooden blocks which fill out the blades to a proper airscrew form.

A special airscrew of this type is made for engine-testing purposes. This is shown in the illustration attached. In this the skeleton steel arms consist of a pair of parallel rods, whereupon a variable number of profiling blocks may be slipped to adjust the airscrew brake to the output of the engine. These blocks are then secured by a steel cap and appropriate nuts at the end of the rods.



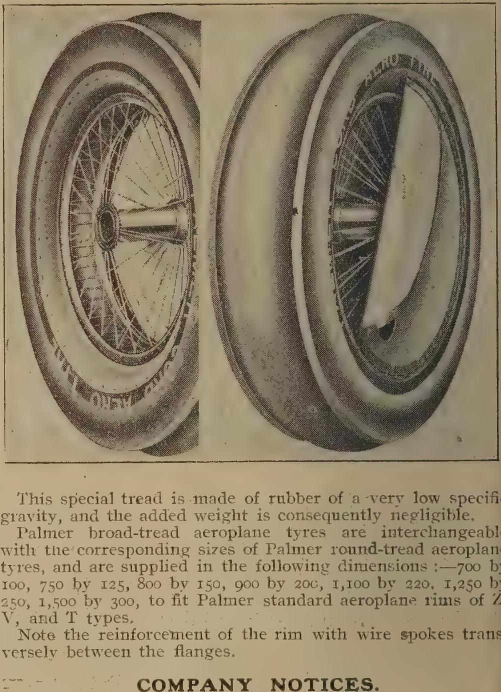
Both the brake airscrew and the aircraft version are said to have given satisfactory results.

# TRADE NOTES.

## For Soft Aerodromes.

Herewith are reproduced illustrations of the Palmer broad-tread aeroplane tyre which was designed during the war for winter use on aeroplanes which had to operate from aerodromes where the ground was soft or partially waterlogged.

Machines equipped with the Palmer broad-tread aeroplane tyres get away under their own power when conditions are such that with the ordinary round-tread tyre they would be hopelessly bogged. These tyres have been proved to be equally successful on loose sand.



This special tread is made of rubber of a very low specific gravity, and the added weight is consequently negligible.

Palmer broad-tread aeroplane tyres are interchangeable with the corresponding sizes of Palmer round-tread aeroplane tyres, and are supplied in the following dimensions:—700 by 100, 750 by 125, 800 by 150, 900 by 200, 1,100 by 220, 1,250 by 250, 1,500 by 300, to fit Palmer standard aeroplane rims of Z, V, and T types.

Note the reinforcement of the rim with wire spokes transversely between the flanges.

# COMPANY NOTICES.

## Mortgages, Charges and Satisfactions.

**Malden Engineering and Aircraft Equipment Co., Ltd.**—Debenture dated Dec. 15th, 1920, to secure £2,600, charged on the company's undertaking and property, present and future, including uncalled capital (if any) Holders: Electrical Specialities Co., Ltd., 21, Woodstock Street, Oxford Street, W.

**Blackburn Aeroplane and Motor Co., Ltd.**—Two memorandums of deposit dated Nov. 29th and Dec. 8th, 1920, to secure all moneys due or to become due from company to Union Bank of Manchester, charged on certain land and premises in Leeds and E. Brough, Yorks.

**Grahame-White Co., Ltd.**—Charge on certain land and buildings in Hendon and the company's undertaking and property, present and future, including uncalled capital, but excluding land with cottages, etc., thereon, near Colindale Avenue, Hendon (subject to prior charges), dated Dec. 23rd, 1920, to secure £6,375. Holder: President of Air Council.

## Receiverships (Appointment or Release).

**Aero Tanks, Ltd.**—A. Charlesworth, of 4, Fenchurch Avenue, E.C., and W. R. Gaff, of Capel House, 54, New Broad Street, E.C., ceased to act as receivers or managers on Dec. 31st, 1920.

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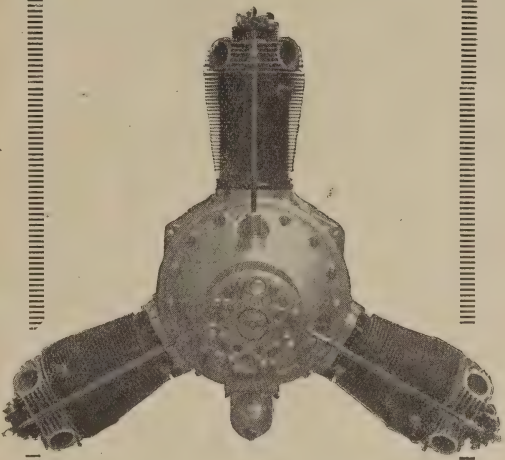

This engine combines simplicity of design, ease of assembly, reliability and long life with the numerous advantages incidental to an air-cooled engine.

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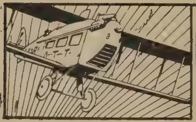

# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.

# THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

## CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G.E.A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

## The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

### JANUARY 17th:

NIL.

### JANUARY 18th:

NIL.

### JANUARY 19th:

M.A., Breguet, F-CMAH, London-Paris, 12.42-14.50, G.&M., Nil, Martel.
M.A., Breguet, F-CMAI, London-Paris, 12.42-14.50, Nil, Nil, Le Men.
S.N.E.T.A., DH4, O-BALO, Brussels-London, 12.30-15.40, G.&M., Nil, Delzenne.

### JANUARY 20th:

S.N.E.T A., DH4, O-BALO, London-Paris, 13.30—, G.&M., Nil, Delzenne
M.A., Breguet, F-CMAD, Paris-London, —15.56, G., Nil, Challoux.

### JANUARY 21st:

M.A., Breguet, F-CMAD, London-Paris, 12.40-15.25, G.&M., 2, Challoux.
M.A., Breguet, F-CMAC, Paris-London, 10.35-13.55, G., Nil, Martel.
M.A., Breguet, F-CMAH, Paris-London, 12.35-16.01, M., 3, Le Men.
G E.A., "Goliath," F-GEAC, Paris-London, 12.35-15.30, G., 5, Labouchere & 1.
M.A., Salmson, F-CMAN, Paris-London, 12.35-16.00, G., Nil, Charpentier
S.N.E.T.A, DH4, O-BADO, Brussels-London, 12.17-15.40, G.&M., Nil, Van Opstal.
H.P.T., Martinsyde, G-EAWE, London-Warsaw, 13.40—, Nil, Nil, ——

### JANUARY 22nd:

M.A., Breguet, F-CMAC, London-Paris, 13.00-15.45, Nil, Nil, Martel.
M.A., Salmson, F-CMAN, London-Paris, 13.02—, Nil, Nil, Charpentier
G E.A., "Goliath," F-GEAC, London-Paris, 13.15—, G., 2, Labouchere & 1

### JANUARY 23rd:

NIL.

## The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

No departures or arrivals for week Jan. 17th-23rd.

## Air Port Statistics.

CONTINENTAL

| | | | |
|---|---|---|---|
| MACHINES: | | | |
| | Croydon 15 | Cricklewood Nil | Total 15 |
| PERSONNEL.—Passengers: | | | |
| | Croydon 12 | Cricklewood Nil | Total 12 |
| Crews: | | | |
| | Croydon 17 | Cricklewood Nil | Total 17 |
| | | | Total Personnel 29 |

## Inland Flying at Croydon.

Jan. 17th.—L.A.S. Avro to Leatherhead (Muir).
Jan. 18th.—Nil.
Jan. 19th.—L.A.S. DH6 to Leatherhead (Muir).
Jan. 20th-21st.—Nil.
Jan. 22nd.—L.A.S. Avro from Leatherhead and joy-riding (Muir); and I.A.L. "Vimy" joy-riding (Barnard).
Jan. 23rd.—L.A.S., DH6, from Leatherhead (Muir); Avro and DH6 joy-riding, Avro and DH6 to Leatherhead, I.A.L. "Vimy" joy-riding (Barnard).

## Accrington.

The Berkshire Aviation Co. began a flying fortnight at Accrington which terminated on the 16th inst Flights took place daily in all weathers from their site off Burnley Road.

Free flights were given with the *Accrington Observer and Times*, over 2,000 applications being received for the ten flights offered.

This is the first time in the history of the town that flying has taken place in the vicinity, and in spite of the inclement weather there were no shortage of passengers

Messrs Taylor and Holmes were in charge of the proceedings, and Mr. A. L. Robinson was chief pilot.

Preston will receive its second visit from the Berks Aviation Co. at the end of the month.

## Brooklands.

There has been no flying at Brooklands for a considerable time.

The Vickers works have practically completed the number of commercial "Vimys" ordered for China. Work on the new "Viking IV" has been started in the shops, and altogether there is a considerable amount of aeronautical activity at the works.—J. F. S.

## Woking.

Practically all the employees of Martinsyde, Ltd., Woking, have been temporarily discharged, only the clerical staff and a few hands in various departments being maintained. It is hoped that the works will be in full swing again during the first week in February.

Mr. D. S. Fripp, F.S.A., who is the receiver appointed by the High Court to manage the business on behalf of the debenture holders, states that there is at present no intention of closing down the works, and that he has instructions to "carry on." The present stoppage is due to over-production in certain departments. One understands that among the various causes of the firm's present position is the payment of a large sum in Excess Profits Duty which has had to be made. The firm have received large forward orders for motor-cycles, etc., from agents. The hangars and shops at Brooklands are being retained.

# THE BRITISH DOMINIONS BEYOND THE SEAS.

## AUSTRALIA.

### Melbourne—Brisbane.

Mr. C. J. Degaris, a Melbourne business man, who on Nov. 30th, last year, flew from Melbourne to Perth, a distance of 2,169 miles, on a D.H.9, left Melbourne, as passenger on a D.H.4, on Jan. 9th, and arrived at Brisbane on the following day. Three landings were made *en route*, the actual flying time for the distance of 1,100 miles being 10½ hours.

### Aviation in Queensland.

According to the *Queensland Register* negotiations have recently been completed in South Queensland for an aviation scheme of much concern in Queensland. A company with a nominal capital of £100,000 has been formed, backed largely by Queensland pastoralists, for the purpose of establishing a regular aerial service between the outback stations and the railheads. The first two aeroplanes have been flown to the main base at Wintor.

The company promises to establish depots at Wintor, Longreach, Charleville, and Cloncurry, and to maintain a regular mail and passenger service between those four railheads. In addition, however, the Federal Government has been asked to co-operate by establishing or subsidising aerodromes at Camooweal, Avon Downs, Anthony's Lagoon, Newcastle Waters, and at Katherine, connecting with Darwin by rail. This scheme would bring Darwin 10 or 12 days closer to Melbourne than it is at present.

By train from Melbourne to Charleville is about four days' journey; thence to Katherine by Avro triplane could be accomplished in about three days, with an extra day for the train journey to Darwin. Thus the journey, Melbourne to Darwin, and back, could easily be accomplished inside three weeks, even allowing two or three days for business at Darwin. A triplane will be used for a twice weekly service between Charleville and Cloncurry.

The aeroplanes, which will carry a pilot and two passengers, will be used principally for ordinary services between the scattered homesteads of Central Queensland and for general business purposes in place of motor cars. As the service develops aeroplanes and spares will be stationed at Longreach, Wintor, Cloncurry, and Charleville.

# FOREIGN INTELLIGENCE.

## CHINA.

### Commercial Aeroplanes Commandeered.

It appears that in spite of all the written guarantees given by the Chinese Government that the Handley Page and Vickers-Vimy commercial biplanes supplied to them would only be used for commercial purposes, a considerable amount of trouble has been experienced by the British Legation in Peking.

In a recent civil war, an attempt was made to use these machines, but the British Legation intervened, and ordered all British subjects to refrain from flying or rendering any aid to the Chinese military during hostilities. After the victory of the northern militarists, Generals Chang Tso-lin and Tsao Kun took possession of the Nanyuan aerodrome and commandeered all the aircraft there, three Handley Pages being sent to Paotingfu, and an unknown number of Vickers Vimys to Mukden. A formal protest from the British Legation met with the reply that the matter was one concerning the internal administration of China.

### Peking-Shanghai Service.

The Cabinet has sanctioned the inauguration of an air service between Peking and Shanghai, a distance of fully 700 miles, with three intermediate stations and 80 landing-grounds. It is hoped that after carrying the mails for six months a public service will have been secured which will carry both passenger and goods traffic.

## COLUMBIA.

The Danish correspondent of THE AEROPLANE writes :—

Going out to Columbia since the Armistice the German Herr W. Kaemmerer had formed a "Sociedad Colombo-Alemana de Transportes Aeros," for a seaplane service once or twice weekly between Barranquilla—the home of the company—and Puertos Wilches, Berrico and Girardot, on the Magdalena River.

On return to Germany he engaged engineer Hammer as chief pilot and ordered two Junkers, 185-h.p. B.M.W. engined 6-seater limousine seaplanes, that were dispatched in the middle of July, arrived at Puerto Columbia at the end of August, and started operations early in September, in the presence of representatives of the Government, Police, Church, Army and Press. The German Consul emphasised in a speech the friendship of Germany and Columbia, as evidenced by the early trade resumption with this aerial enterprise, and might have added that the Germans still know how to pay attention to local taste, as the seaplanes are painted with the national yellow, blue, and red colours, and were thus on the inauguration flight up the river on Sept. 9th, greeted with "Viva Alemania" cheers.

## FRANCE.

### Grand Prix de l'Aero Club.

The Aviation Committee of the French Aero Club has fixed the trials of the Grand Prix de l'Aero Club for Feb. 20th-22nd, April 22nd-24th, and May 20th-22nd, inclusive, and has appointed a sub-committee to make arrangements for the Aerial Derby round the World in agreement with a representative of the American Aero Club now in Paris.

### Chevalier Sadi Lecointe.

M. Sadi Lecointe, the winner of the Gordon Bennett Trophy and the present holder of the world's speed record, has been made a Chevalier of the Legion of Honour.

The Italian correspondent of THE AEROPLANE writes :—

### Riviera Seaplane Service.

The Italian S.I.A.I. firm write one with legitimate pride that the Riviera seaplane service de luxe which began operations on Jan. 15th is employing Savoia machines, three of which were to be delivered to the Transaériennes Tourisme et Messageries at Antibes by air from Sesto Calende, Italy, early in January.—T. S. H.

## GERMANY.

A correspondent of THE AEROPLANE in Berlin writes :—

### Surrendering of German Aircraft.

On December 17th the Reichstag, in three readings, accepted an Act on the registration of all aviation material that has not been delivered up, despite the announcement of the Federal Chancellor of the Exchequer setting a definite date for this by August 5th last. A new term of grace has now been determined on, after the lapse of which fines of a maximum sum of 10,000 marks or prison totalling a year will punish the offenders.

A well-known member of the industry remarks on this new Bill in a Berlin daily journal that it is hardly likely that there is a considerable amount of aviation material in the country. "Nevertheless," he continues, "there may certainly be some hidden away for speculative purposes. It cannot be accurately proved whether aeroplanes returning home after the collapse of our military action in Palestine, the Ukraine, the Black Sea, Estland, Podalia, from the Western front, etc., either as an entity or parts of such, motors, instruments, are not hidden away in peasant houses, in forests, etc., until they can be produced with safety.

"It is necessary above all things that the new law be made more extensively known and published by the district authorities even in the smallest villages. All concerned should regard it as their bounden duty to deliver up whatsoever may still be in their possession. It is a question of the salvation of our aero industry and the welfare of the thousands of employees earning their livelihood thereby. Another thing, what speculative purpose can such concealment serve? The aeroplanes, or their parts grow rusty, and motors of two or three hundred h.p. are hardly useable in future, as the development of things points to economic and rational weaker motors of 50, 100 and 150 h.p. Amnesty is offered once again, and for the last time."

This new law is in reality a sequel to the note the German Government sent the Conference of Ambassadors through the Control Commission, in which is stated that the German Government never acknowledged the justification of the Allies to prolong the term of prohibition for the construction of aeroplanes, which expired on July 10th, 1920, without its assent. A protocol in which Germany was requested to recognise the prolongation was returned by her together with a statement of the reasons for this step, and was never acknowledged. The German Government therefore upholds its standpoint, which is in agreement with the Versailles Treaty. The Government has again set forth the economic necessity of preserving the aviation industry from entire ruin, and pronounces its willingness to enter into negotiations on how best to establish a control of the material used in the construction of civilian aeroplanes. The Conference of Ambassadors is requested to reconsider the prolongation question.

The Aeroplane Workers League and the Workmen's Councils of a number of aviation firms have addressed protests on this matter to the Federal Air Office, the Foreign Office, and through the German Trade Unions headquarters to the Amsterdam centre of the International League of Trade Unions, emphasising the economic ruin threatening them.

It is useful to learn that up to the end of October of the current year 14,000 flying machines, and 27,000 motors, including the best and most up-to-date material, were destroyed, a heartrending and appalling waste of values from the viewpoint of political economy.

### Junkers Monoplanes Released for Shipment to America.

The Junkers aeroplanes built to the order of an American firm, and confiscated temporarily by the Control Commission prior to shipment at Hamburg, have been released, and are now on their way to the United States.

### Aeroplanes for Winter Resorts.

The Sablatnig firm has just brought out an aeroplane fitted with skis instead of wheels to enable the start and landing to be effected without danger in the snow. Limousines so fitted, and able to carry a number of passengers, will be sent to the chief German winter-sport resorts to give exhibition flights.

### Bavaria as an Aerial Centre.

A Munich paper publishes an interesting little article on the importance of Bavaria for international aero-traffic, on geographical and economic viewpoints. "Germany, and Bavaria above all, must gain in importance for aerial traffic owing to their position in the very heart of Europe," the paper declares, and goes on to state that "this fact has been acknowledged by Entente circles, although Austria with Vienna, and Czecko-Slovakia with Prague, are trying to outrival Bavaria by granting very considerable concessions.

"These attempts at competition should not be overlooked, as they endanger Bavaria's supremacy as an aviation centre. Munich should be regarded as a central, and Nuremberg as a transit, station."

### A Germano-Swiss Aerial Agreement.

The German-Swiss aerial agreement, which is, however, only of a provisional nature, has been signed at Berne. It concerns cross-traffic with such civilian air-craft officially registered by the two parties to the agreement.

The compact secures each signatory the right to cross the territory and waters of the other nation in times of peace, and also determines the spots where landings may be effected.

### Aerial Legislation in the Rhineland.

The German Government has been handed a note dealing with aerial traffic in the Rhinelands, in which aerial journeys to or passages across the occupied territories are forbidden until Germany is granted membership of the League of Nations or the Air Convention of Oct. 13th, 1919.

Once the Armies of Occupation are withdrawn German airships and aeroplanes are free to carry on aerial services, but may only land at determined points. Germany cannot have any aerial intercourse with the neutral zone until the Entente allows her to commence construction.

### Air Mail Connections.

It has been reported that the daily air mail service between Berlin and Gelsenkirchen, has been linked up with the important manufacturing districts in a 20-mile radius of Essen by a regular service of motor-cycles. The air mail leaves Berlin at 10 a.m. daily and reaches Essen in 2¾ hours, as compared with the 10-hour train journey.

### A Stuttgart-Constance Service.

In order to include Stuttgart in regular postal cross-country traffic, a private undertaking has started a service from the Wuerttemberg capital to Constance.—S. B.

### London-Berlin Air Service.

It was reported in the *Times* for Jan. 17th that in the spring a regular air service will run between London and Amsterdam, with connections to Hamburg, Copenhagen and Berlin, and by means of the smaller German interior air lines, to all the principal German cities. The route to Copenhagen will be extended by a seaplane service to connect with Sweden.

It is said that the Fokker F.2, 6-passenger enclosed cabin monoplane, fitted with the 240-h.p. Siddeley "Puma," will be used, a number of which are now being built at the Fokker works at Amsterdam. It is known that the Fokker firm is using this engine.

### Zeppelin Works Active.

According to the German technical Press, the Zeppelin factories are being kept in running order as far as possible. The Friedrichshafen works are engaged on the making of automobile engines and spare parts, and are now working in double shifts with orders sufficient to keep them going of a long time.

### Germany's Air Service.

In an interview granted to the *Berliner Tageblatt* by Herr Gessler, the Minister of Defence, concerning the present state of Germany's armed forces, he is reported to have said that Germany has now no Military Air Service. "The aeroplane is a weapon that must be used in mass, and no serious politician will believe that Germany is silly enough to order military aeroplanes here and there."

The Danish correspondent of The Aeroplane writes :—

### Plywood Patent.

The Rumpler works have in the courts successfully fought the Albatros company over plywood fuselage rights, with the result that other works are now claiming back paid royalties.

### A Weekly News-sheet.

The German Air Ministry is now issuing a very well informed weekly review of aerial news the world over.

### Air Mail between Berlin and Munich.

An aerial service between Berlin and Munich was officially opened by the Deutsche Luft Reederei on Jan. 4th. The fare for the journey amounts to 800 marks.

## HOLLAND.

The Danish correspondent of The Aeroplane writes :—

### Parachutes for the Army.

The German aero journal *Illustrierte Flug-Welt* is responsible for the notice that in Holland, where all Government aeroplanes have compulsorily to be equipped with parachutes, 60 German Heinicke parachutes have been bought after trial with the English Calthrop make. "The latter, indeed, gave good results, it is stated, but the parachute had after use to be sent back again to the works for repair, for which reason this make was not employed."

The parachute of the erstwhile airship pilot Heinecke will be remembered to be the one used in the latter part of the war on aeroplanes and being of the cushion type, on which the pilot sat with connection to the aircraft by a string, the length of which varied according to the speed of the aeroplane.

For kite-balloons the earlier type of the former parachutist, Miss Kathe Paulus, was employed, and it will be interesting news in some quarters that with a view to saving the valuable instrument equipment of the basket and to reduce to some extent the nerve strain of the observer in making up his mind to jump overboard, the Germans provided towards the end of the war the whole basket of the kite-balloon with a big parachute.—E. H.

## ITALY.

The Italian correspondent of The Aeroplane writes :—

Arrangements for coming events seem to be occupying the attention of the aeronautical world chiefly just now. Having decided that the local regulations for the 1921 Schneider Cup should be as before the F.A.N.I. delegate at the recent Paris meeting had to give way over the useless or rather unusable weight to be carried which is now to be 200 instead of 300 kilograms.

It has been decided, too, that the Aero Grand Prix, which was to have been flown for at Brescia in 1920, and was postponed, shall be carried out in 1921; also that the Lake Garda marine flying machine meeting, likewise postponed, shall take place in May to catch the Monte Carlo competitors if possible.

Considerable aerial activity is reported from Rome, Naples, and down South generally; the while the F.A.N.I. (the Italian Aero Club) has called upon its member to debate on the revising of its statutory regulations.

Fusion, amalgamation and other economical moves making for strength and mutual support among people professing aviation give room for sanguine trust in the future.—T. S. H.

### The S.A.I.A.M. and Aerodromes.

The Società Anonima Imprese Aeree, Milano, commonly known as the S.A.I.A.M., are engaged, at the present moment, in endeavouring to have the aerodromes of Italy, especially those under Government control, placed in better condition, and quite recently the President and a part of the Technical Staff of the S.A.I.A.M. paid a visit to Rome in order to call on that part of the Government that is equivalent to the British Air Ministry. It was pointed out that whereas other continental aerodromes are fully equipped for flying in all weathers, there are some aerodromes in Italy where there is not even telephone connection, and wireless is known only by name.

As the result of the interview considerable interest was aroused by the various officials so concerned; but it does not do credit to those in such positions to have confessed ignorance of the mere requirements of pure straightforward flying. To a country such as Italy, which is not only suffering from the aftermath of war, but is also endeavouring to cope with an internal social upheaval which, in particular, has affected many aircraft factories, every ounce of encouragement should be forthcoming from those in authority, in order to prevent the loss to the aeronautical industry of those firms who in the past have built up a reputation of which any country might be proud.

The S.A.I.A.M. is to be congratulated on bringing so important a matter to the attention of the Government, as it is usually only by considerable outside agitation that it is possible to obtain those little necessities that may convert the already existing and usually useless or extravagant material from the proverbial white elephant into something akin to the British cart-horse, or to be more up to date, although bathetic, the Ford car.—L. B.

## SWEDEN.

### A Savoia Flying Boat in Sweden.

The Italian Capt. de Robilant, who has been in Scandinavia some time, left Stockholm for Reval in October in a Savoia flying boat. On the outward journey he was forced to land owing to a leaky radiator in the Baltic off the Anland Islands. He got going again next day and arrived at Reval.

Three days later he started back with a passenger, and when but 50 miles out the same trouble forced him to land again. After four hours in a rough sea he was picked up by a steamer and towed back to Reval, the boat, as the result of being towed, suffering considerably.

He has now interested a business firm in Stockholm in aviation, and they are purchasing a Savoia flying boat, keeping him as pilot. The machine will be used to carry members of the firm about the country, but chiefly to Finland and Russia.

### Activity in Scandinavia.

The Northern Aviation Co. has bought four aeroplanes of Sopwith construction, one of which, a Sopwith "Dove," left Croydon on Dec. 22nd, piloted by M. G. Andree. Two others will be delivered by Major Johnstone, late of the P.O. Flygkompani, and a Swedish pilot.

The Swedish Customs are now issuing monthly lists of aerial traffic. According to the October returns, 30 foreign aeroplanes arrived in Sweden loaded and 6 in ballast, and 19 left loaded and 17 empty.

## UNITED STATES OF AMERICA.

### Colonel Clark joins Dayton-Wright Division.

According to *Aviation* of Dec. 13th, 1920, Col. V. E. Clark, who has been the chief aeronautical engineer of the U.S. Army Service since July 1st, 1915, has left the Army to become the chief engineer to the Dayton-Wright Division of the General Motors Corporation.

Col. Clark was one of the original 1913 San Diego school of aviators, and has been a military aviator since 1917. He was engaged in the engineering supervision of the design and construction of U.S. military aircraft, and was a member of the Bolling Mission that visited Europe during the War. He was in charge of the organisation and construction of McCook Field Experimental Station, and was its first commanding officer. Since the war he has been in charge of the design and planning section of the Engineering Section of the Air Service at McCook Field.

### WANTED: A BACK NUMBER.

Can any reader of The Aeroplane who has back numbers to spare oblige with a copy of the issue for April 17th, 1918? A reader of The Aeroplane particularly wants a copy of that issue, and if any other reader can oblige with a copy he will be doing a kindness if he will send it to 175, Piccadilly, W.1.

# CURIOSITIES OF THE U.S. ARMY AIR SERVICE.

There has recently been issued by the United States War Department the "Report of the Director of Air Service to the Secretary of War, 1920." In it is a detailed account of the progress and present condition of the U.S. Army Air Service written by, or under the direction of, Major-General C. T. Menoher, now Chief of the Air Service.

In view of the length of the Report—it covers forty-nine octavo pages, it is impossible to do more than give references to the more generally interesting parts of the paper.

One primary difference between the United States Air Service and the Royal Air Force is in the supreme command. In Great Britain the Chief of the Air Staff is a member of a Council on which sit with equal rights other officers such as the Director-General of Supply and Research and the Director of Personnel. If his personality is strong he can, in virtue of his specific duties, exercise a considerable degree of general control, but he has no legal support in the matter. In the United States of America the Director of Air Service is supreme, and all departments of the military air service are directly responsible to him. He is, in fact, commander-in-chief, with a greater degree of power than that ever possessed by the C.-in-C. of the British Army in the days before the Army Council came into being.

### THE CREATION OF THE AIR SERVICE.

The existing Air Service was created by Executive order. Under the Overman Act it received legislative authority for its existence as a separate organisation (i.e., a separate branch of the Army under conditions analogous to that of the Royal Artillery in this country) on July 11th, 1919, this authority lapsing on June 30th, 1920. The Army Re-organisation Act of June 4th, 1920, gave the Air Service continued and permanent existence under the pre-ordained conditions.

### OFFICERS.

In 1914 the authorised establishment of officers was 148. These figures increased enormously during the war, and on July 1st, 1919, there were 262 Regular and 5,313 Temporary Officers. On June 30th, 1920, the end of the fiscal year to which the report refers, the numbers, considerably decreased, were 155 Regular and 1,013 Temporary Officers. On the same date the Aviation Section, Signal Officers Reserve Corps (it must not be forgotten that the aviation branch of the Army was originally manned from and administered by the Signal Corps, U.S. Army) had on its strength 5,046 pilots and 2,293 others, all officers.

### "OTHER RANKS."

In regard to "other ranks" (in the American language "enlisted personnel") the strength on July 1st, 1919, was, in Regular personnel 6,711, in "emergency" (presumably "temporary" in the British sense) 7,858, and in "Overseas" (the divisions in category of the U.S. Army are perhaps a little invidious) 6,804. By June 30th, 1920, the proportions had altered as follows:—Regular Army, 8,420; Emergency, 6; Overseas, 2. Nothing is given in the Report as to the authorised establishment.

There are some things we do better in England. Our military forces are quite capable of carrying out their own work with a minimum of civilian assistance. The U.S. Air Service, on the contrary, employ no less than 8,155 civilians. [Presumably because of the value of their votes.—Ed.]

### EXPENDITURE, 1919-20.

The sum voted for the Army Air Service on July 11, 1919, was 25,840,197 doll. (including two additional credits). The major part of this sum went as follows:—

| | Doll. |
|---|---|
| Maintenance and operation of stations | 2,042,258 |
| Salaries and expenses of civilian employees | 8,184,285 |
| Experimental and research | 2,438,544 |
| Production and purchase of airplanes [*sic*] and their spare parts | 4,290,536 |
| Production and purchase of engines and their spare parts | 1,496,244 |
| | 20,343,054 |

The remaining five millions were expended on such things as photographic supplies, improvement of aviation stations, development of helium (483,900 doll.), utilities at stations (whatever they may be), production and purchase of balloons, etc., down to the minute allotment of 981 doll. for "Purchase, manufacture, and issue of special aviation clothing and similar equipment."

The Director of Air Service says these "appropriations" are inadequate and one must perforce agree. It is curious that a third of the total allocation is set aside for the payment of civilian employees! Here again the more civilised races may take credit for greater economy and greater wisdom.

### THE PURCHASE OF LAND.

The pay of the military personnel does not appear in these charges as it is allowed for in the general sum for Army pay. In addition, there were appropriations for Aviation Sea-coast Defences in the States and the Colonies. Of the eleven millions of dollars (approximately) set aside for this purpose some four millions were left unspent and will return to the Treasury. It is amusing to record that though the appropriation was given by whatever rules the United States the necessary permission to buy the land on which the works and defences would have to be built or laid out was withheld. Thus the appearance of generosity was attained without great cost.

The majority of aerodromes in use by the Air Service are held on lease. In addition to the eleven aerodromes and two supply depots owned outright in July, 1919, nine additional aerodromes and several supply depots were purchased before June, 1920. In one case—at Langley Field—oyster rights were purchased, whether as sustenance or for the preservation of official secrets is not revealed.—W. E. DE B. W.

*(To be continued.)*

# NAVAL AND MILITARY AERONAUTICS.

## GREAT BRITAIN.

### War Relics for Disposal.

A Naval order issued on Jan. 19th contains a list of trophies, including various scientific instruments, electrical apparatus, flags, etc., from the Zeppelins L.32, L.33, L 48, and L.70, that are available for disposal at Chatham.

His Majesty's ships and establishments wishing to acquire any of these items for experimental purposes or as trophies should forward their applications to Admiralty, Naval Store Department, before Feb. 21st.

### R.A.F. and Naval Sports.

The question has been raised of officers and men of the Royal Air Force, while serving in Naval units, playing in officially recognised Naval competitions, both individual and team, and a decision on the matter is promulgated.

These officers and men are not eligible to take part in individual or officially recognised team competitions By this is meant individual Naval and Marine competitions, open to the Naval Service only, or fleet and squadron competitions, fleet Association football leagues, and the like. But R.A.F. personnel may, if so desired, take part in "friendly" games.

### Great Yarmouth Reunion Dinner.

It is proposed to hold, on Feb. 19th, in London, a reunion dinner of all officers and other ranks who served under the Great Yarmouth Command during the late war. Tickets, 12s. 6d. each.

Will all those interested forward their names and remittances, together with names and addresses of other Yarmouth men they may know, to R. F. Smith, 82, Grange Park Road, Leyton, N.E.?

### The Royal Air Force Memorial Fund.

The following notice has been received from the Secretary of the Royal Air Force Memorial Fund:—

A meeting of the Executive Committee was held at 7, Iddesleigh House, Caxton Street, S.W.1, on Friday, Jan. 21st, 1921, at 3 p.m. Lord Hugh Cecil in the Chair. Among the members of the Committee present were Dame Helen Gwynne-Vaughan, Sir Chas. McLeod, Sir John Salmond, and H. E. Perrin, Esq.

The Hon. Treasurer, Sir Chas. McLeod, presented to the meeting a statement of accounts from Oct. 19th, 1919, to Dec. 31st, 1920, audited by Messrs. Blackburns, Barton, Mayhew and Co. The statement was signed by the Hon. Treasurer, Secretary, and Assistant Secretary.

Grants amounting to £919 6s. 2d. made by the Fund during the past few months, and embodied in the above statement, were approved, and the expenditure authorised.

Grants amounting to £173 17s. 11d. made since the last meeting on Dec. 16th, 1920, were approved and authorised.

A list of donations and subscriptions received since last meeting, amounting to £629 12s. 1d. was submitted, and is included in the grand total at the end of this statement.

A resolution embodying a scheme for granting aid to the post-war Royal Air Force was adopted, and A.V.M. A. V. Vyvyan has been asked to accept the chairmanship of the sub-committee appointed to deal with this matter, and the members will consist practically of serving officers and other ranks of the Royal Air Force.

Regarding the R.A.F. Memorial, a letter was read from the First Commissioner of H.M. Works, suggesting three sites for the Memorial. The one which received the most favourable consideration is at Whitehall Stairs, on the Thames Embankment, midway between Westminster Bridge and Hungerford railway and footbridge. The Committee inspected the plan of this site, and the Secretary was instructed to communicate with the members of the Executive Committee not present at the meeting, and to request them, if possible, to visit this site before the next meeting, when a full discussion on the whole subject will take place.

The scheme for the establishment of a Boys' Home at Vanbrugh Castle, May's Hill, Blackheath, is proceeding apace, and a contract has been signed for the decorations and improvements at the Castle.

The first Annual Report of the Fund is in course of preparation, and it is hoped will be issued about the end of February.

The question of a Charter being applied for was considered, and the Solicitors to the Fund were requested to give their advice on this matter, and to state, if possible, how long it would take to secure the Charter, and at what cost

The next meeting of the Committee will be held on Thursday, Feb. 17th, at 3 p.m., at the Offices of the Fund.

| | |
|---|---|
| Amount of donations and subscriptions announced up to December 15th, 1920 | £102,747 10 10 |
| Amount since received up to January 20th | 629 12 1 |
| Total | £103,377 2 11 |

## EXTRACTS FROM "THE LONDON GAZETTE."

Air Ministry, Oct. 29th.

ROYAL AIR FORCE.—Permanent Commissions.—Flying Officer B. V. S. Smith, M C., A.F.C. (half-pay list), resigns his permanent commn., Oct. 30th.

Short Service Commissions.—Flying Officer R W. Godfrey resigns his short service commn., Oct. 30th; Pilot Officer G. E. Newton is granted a short service commn. as a Flying Officer, Oct. 18th (substituted for notification in "Gazette" of March 30th). The notification in "Gazette" of Aug. 24th concerning Observer Officer R. A. Brunton, M.C., is cancelled. Flying Officer C. E. Amoore resigns his short service commn., Oct. 30th.

Flying Branch.—Flying Officer C. L. King, M.C., D.F.C., is placed on half-pay list, scale (B), Oct 22nd

Memoranda.—Lt.-Col. (Actg. Brig.-Gen.) C G. Hoare, C.M.G. (Maj., Ind Army), relinquishes his R.A.F. commn. on ceasing to be empld., May 24th, 1919 (substituted for notification in "Gazette," July 15th, 1919).

Capt. (Actg. Wing Comdr.) G. W Parkinson, M.C., is transferred from S.O. to unempld. list, Nov. 15th, 1919.

Air Ministry, Nov. 2nd.

ROYAL AIR FORCE.—Short Service Commission.—Flying Officer E. L. Zink resigns his short service commn., Nov. 3rd.

Air Ministry, Nov. 5th.

ROYAL AIR FORCE.—Air Vice-Marshal J. F. A. Higgins, C.B., D.S.O., A.F.C., is restored to the active list, Oct. 19th.

Air Ministry, Nov. 9th.

ROYAL AIR FORCE.—Short Service Commissions.—Sqdn.-Ldr. E. M. Bettington resigns his short service commn (Oct. 1st).

Technical Branch.—Flying Offr. (actg. Flight Lt.) W. Borland, M.B.E., relinquishes the actg. rank of Flight Lt. on ceasing to be empld. as Flight Lt. (Sept. 22nd).

Pilot Offr. E. J. Rossiter to be Flying Offr, Grade (B) (Oct. 1st, 1919).

Air Ministry, Nov. 12th.

ROYAL AIR FORCE.—Permanent Commissions.—Stores Branch.—The following are granted permanent commns. in the ranks stated, with effect from the dates indicated, retaining their present seniority, and are transferred to the Stores Branch, with effect from June 17th:—

Flt. Lt.—H. L. Crichton, M.B.E. (Sept. 16th, 1919).

Flying Offrs.—W. R. P. Allen, E. V. E. Andrewartha, H. P. Bridges, T. E. Drowley, E. I. T. Duffield, J. W. Gage, T. L. Grey, C. A. Longhurst, J. McCarthy, A. Walters, H. L. Woolveridge, F. C. Worton (Sept. 12th, 1919); W. Best, A. T. Cooper, D. W. Dean, R. V. J. S. Hogan, L. T. Sanderson (Sept. 16th, 1919); A. W. Smith (Jan. 20th).

The notifications in the *Gazettes* of the above dates, appointing these officers to short service commns., are cancelled.

Short Service Commissions.—Flying Offr. T. V. Villiers relinquishes his short service commn. on account of ill-health contracted on active service, and is permitted to retain his rank (Nov. 13th).

Stores Branch.—The following are granted short service commns. in the ranks stated, with effect from the dates indicated, retaining their seniority in the substantive rank last held prior to the grant to his commn.:—

Flt. Lts.—P. Adams, O.B.E., H. T. Foxen, E. D. Galloway, T. G. Gordon, M.B.E., G. Stevens (June 17th).

Flying Offrs.—R. Q. Bamber, R. Bassett, R. Blackith, C. H. Boreham, H. W. Clarke, F. E. C. Finzel, C. Harvey, H. B. Hawker, F. A. Ormerod, L. R. Peirce, J. A. Plunkett, J. Roberts, W. L. Shaw, O.B.E., F. S. Stokes, T. Surr, C. St. J. Vaughan (June 17th); E. G. Steer (Oct. 11th).

Air Vice-Marshal J. F. A. Higgins, C.B., D.S.O., A.F.C., is placed on the half-pay list, Scale (A) (Oct. 28th).

Flying Branch.—Flt. Lt. G. B. A. Baker, M.C., is restd. to the active list (Nov. 8th).

Air Ministry, Nov. 16th.

ROYAL AIR FORCE.—Permanent Commissions.—Wing Cdr. L. L. Greig, M.V.O., M.B., is placed on the retd. list at his own request (Nov. 18th).

Stores Branch.—The following are granted permanent commns. in the ranks stated, with effect from the dates indicated, retaining their seniority in the substantive rank last held prior to the grant of this commn.:—

Wing Cdr.—F. H. Kirby, V.C., O.B E., D.C.M

Squadn. Leaders.—W. R. Bruce, O.B.E, T. O. Lyons, O.B.E., J. E. Parkin, M.B.E., J. H. Wilford.

Flt. Lts.—C. L. Archbold, W. E. Aylwin, O.B.E., F. A. Baldwin, N. R. Fuller, C. Mason, W. H. G. Maton, M.B E., D. McBirney, J. Rylands, T. G. Skeats, R. W. Thomas, O.B.E., W. J. Waddington, O.B.E, B W. M. Williams (June 17th); W. C. Clark, W. Millett (July 20th).

Flying Officers.—F Anderson, T. Bell, M.M, E. S. Bullen, L. E. Carter, K. D. G. Collier, A. H. Comfort, J. P. Crichton, S. D. Dennis, E C. Farman, T. Fawdry, M.B.E., W. A. Kingston, E. W. Lawrence, G. J. Maygothling, C. Y Mitchell, D. Mitchell, A. J. Moore, J. R. Nicholls, T. J. Organ, F. J. B. Powell, M.B.E., F. W. Powell, N. Robertson, H. Sleigh, K. A. Smith, G. T. Stroud, M B.E., F. W. Todd, G. C. Wilson (June 17th); J. Baxter, T. F. Beere, C. E. Cullen, H. J. Dann, C T. Davis, G. Felstead, D.C.M., J. R. Gardiner, W. H. Harrison, H. Jones, A. Jukes, W. St. J. Littlewood, R. D. G. Macrostie, G. Oliver, H. Parker, F. Pratt, A. M. Saywood, R. J. Sladden, M.B.E., D.C.M., O. T. Stone, W Thorne, A. W. Turner, F. R. Wilkins, E. R. Wood (July 20th), R. Craig (Oct 9th).

Royal Air Force Medical Service.—302629 Sgt.-Major, Class I, P. H. Musgrave is granted a permanent commn. as Qrmr. (Medical), with hon. rank of Flying Officer (Nov. 3rd).

Short Service Commissions.—The following are granted short service commns. in ranks stated, with effect from dates indicated, retaining their senty. in substantive rank last held prior to grant of this commn., except where otherwise stated:—

Flight Lt. (from Sqdn. Ldr.).—R. E. Nicoll (Oct. 29th).

Flying Offrs.—H. W. Gardner (Oct. 22nd); W. B. J. Humphrey (Oct. 7th) (and with senty. of that date); A. H. Klynes (Oct. 18th); M. J. Langley, D.F.C. (Sept. 29th); E. W. Nicholson (Oct. 25th); A. J. Warwick (Nov 4th).

Pilot Offrs., on Probation (with senty. of Oct. 29th):—F. V. Gauntlett, E. F. Kohler, C. D. Robertson, M.M., E. A. Rush (Oct. 29th).

Note.—Flight Lt. Nicoll will be placed at the head of the list of Flight Lts., and will retain senty. relative to officers who have been similarly gazetted to short service commns. in a rank lower than their previous substantive rank in accordance with his previous position on the gradation list.

The names of the follg. officers are as now described, and not as stated in the *Gazettes* of the dates indicated:—W. A. N. Appleford, J. C. B. Cumming, W. L. G Spinney (Oct. 1st); H S. Sandiford (Oct. 26th).

Flying Officer J. S. Griffith, D.F C., resigns his short service commn. (Nov. 3rd)

The notification in the *Gazette* of Nov. 12th appointing Flight Lt. G. Stevens, O.B.E., to a short service commn., is cancelled.

Royal Air Force Medical Service.—The notification in the *Gazette* of July 13th appointing the follg. Flight Lts. to short service commns., is cancelled:—F. J. P. Saunders, W. F. Sheil, M.B.

Re-Seconding.—The name of Flying Officer H. B. Hammond (Lt., R.A.) is as now described, and not as stated in the *Gazette* of April 27th.

Flying Branch.—Sqdn. Leader D. R. MacLaren, D.S.O., M.C., D.F.C., is placed on the half-pay list, Scale (B) (Sept. 1st).

Flight Lt. C. H. C. Smith, D.S.C., is placed on the half-pay list (Scale B.) (Nov. 10th).

Flight Lt. D. Cloete, M.C., A.F.C., is placed on the half-pay list Scale (B.) (Nov. 15th).

Air Ministry, Nov. 19th.

ROYAL AIR FORCE.—Flying Branch.—Observer Officer J. E. Kendrick, D.F.C., is restored to the active list (Nov. 15th).

Memoranda.—The notification in *Gazette* of April 9th concerning Wing Comdr. L. A. Strange, D.S.O., M.C., D.F.C., is cancelled.

Air Ministry, Nov. 23rd.

ROYAL AIR FORCE.—Administrative Branch.—Sqdn. Leader G. Blatherwick is restd. to active list, Nov. 19th; Pilot Officer J. H. Amers to be Flying Officer, July 22nd.

Air Ministry, Nov. 26th.

ROYAL AIR FORCE.—Short Service Commissions.—Flying Officer K D. Marshall relinquishes his short service commn. on account of ill-health caused by wounds contracted in the Service, and is permitted to retain the rank of Lt., Nov. 27th.

Flying Officer A. E. de Montaigne Jarvis, D.F.C., resigns his short service commn., and is permitted to retain the rank of Lt., Nov. 27th.

Administrative Branch.—Flying Officer C. C. J. Croydon is granted the actg, rank of Flight Lt., with pay and allowances of that rank, Nov. 12th.

Air Ministry, Nov. 30th.

ROYAL AIR FORCE.—Permanent Commissions.—Sqdn. Ldr. A. L. Neale, M.C., resigns his permanent commn. as Sqdn. Ldr., with effect from Nov. 30th, and is granted a permanent commn. in rank of Flight Lt., with effect from Dec. 1st (to take precedence next below Flight Lt. J. R. McCrindle, O.B.E., M.C.).

Stores Branch.—The following are granted permanent commns. in ranks stated, with effect from June 17th, retaining their seniority in the substantive rank last held prior to grant of this commn.:—

Flight Lts.—W. F. Bryant, T. Fawdry, M B.E. (substituted for notification in "Gazette" of Nov. 16th), G. A. Hilliar.

The following are granted permanent commns. in ranks stated, with effect from dates indicated, retaining their present seniority, and are transferred to Stores Branch with effect from June 17th:—

Flight Lt.—G. Stevens, O.B.E., Sept. 16th, 1919.

Flying Officers.—A Holmes, Sept. 16th, 1919; T. Thomson, Nov. 11th, 1919.

The notifications in "Gazettes" of the above dates, appointing these officers to short service commns., are cancelled.

Short Service Commissions.—The following officers are granted short service commns. in ranks stated, with effect from dates indicated, retaining their seniority in substantive rank last held by them prior to grant of this commn., except where otherwise stated:—

Sqdn. Ldr.—S. M. Cleverly, Nov. 22nd.

Flying Officers.—G. W. Pidsley, Nov. 8th; R. F. Wallas, Nov. 17th; A. R. Wardle, Nov. 17th.

Flying Officer (from Pilot Officer).—W. E Johns, Nov. 23rd, and with seny. of that date.

The notification in "Gazette" of Sept. 12th, 1919, appointing Flying Officer E. P. Dampier to a short service commn., is cancelled.

Flying Officer R. C. Michaelson resigns his short service commn., Dec. 1st.

The names of the following officers are as now described, and not as stated in "Gazettes" of dates indicated:—Flying Officer Charles Willie Bragg, July 23rd; Flying Officer Robert Hugh McCoubrie Sheppard, Sept. 14th.

Stores Branch.—Flying Officer J. Piggott is granted a short service commn., retaining his present substantive rank and seny., June 17th.

Flying Branch.—Flight Lt. J. A. Barron, from half-pay list (Scale B), to be seconded for duty under the Canadian Air Board, Nov. 27th.

Air Ministry, Dec. 7th.

ROYAL AIR FORCE.—Short Service Commissions.—Flying Offr. W. A. Pritt, M.C., resigns his short service commn. (Dec. 8th).

Administrative Branch.—Flying Offr. (actg. Flight Lt.) M. J. Langley, D.F.C., relinquishes the actg. rank of Flight Lt. on ceasing to be empld. as Flight Lt. (Mar. 31st).

Technical Branch.—Flying Offr. J. Durward relinquishes the grading for pay and allces. as Flight Lt. on ceasing to be empld. as Flight Lt. (July 25th).

## THE ROYAL AERONAUTICAL SOCIETY.

### WEEKLY NOTICES.

### Lectures.

Members are reminded that invitation cards for lectures are no longer circulated to Members; the only notification of lectures or special arrangements being, save in exceptional cases, contained in the Weekly Notices in the Press and in the Journal.

The lecture arrangements for the remainder of the present session are as follows:—

Feb. 3rd.—Major G. Dobson, "The Use of Meteorology to Aviation and Vice Versa." Wing Cmdr H. W. S. Outram, A.F.R.Ae.S., "Ground Engineering"; Chairman, G. C. Simpson, Esq., C.B.E., D.Sc., F.R.S., Director of the Meteorological Office.

Feb. 17th.—F. Handley Page, Fellow, "The Handley Page Wing."

March 3rd.—J. W. W. Dyer, "Airship Fabrics"; Major T. Orde-Lees, A.F.C., "Parachutes"; Chairman, Air Commodore E. M. Maitland, C.M.G., D.S.O., A.F.C.

Mar. 17th.—Capt. D. Nicholson, Associate Fellow, "Flying Boat Construction."

### Technical Terms Committee.

It has been arranged with the British Engineering Standards Association that the revision of the "Glossary of Aeronautical Terms," published by the Society in 1919, shall be continued under the auspices of the Association. The Technical Terms Committee of the Society, which also acted as Aircraft Sub-Committee No. 1 (Nomenclature) of the B.E.S.A., has been placed at the disposal of the Association for this purpose.

### Library.

The following book has been received and placed in the Society's Library:— "Clouds," by George A. Clarke, F.R.P.S., F.R.Met.Soc.

Royal Aeronautical Society, W. Lockwood Marsh,
7, Albemarle Street, S.W.1. Secretary.
January 21st, 1921.

## THE ROYAL AERO CLUB.

### COMMITTEE MEETING.

A Meeting of the Committee was held on Wednesday, Jan. 12th, 1921, when there were present Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the chair, Mr. Ernest C. Bucknall, Lieut.-Col. Spenser D. A. Grey, D.S.O., Lieut.-Col. Alec Ogilvie, Lieut.-Col. Mervyn O'Gorman, C.B., and the Secretary.

### ELECTION OF MEMBERS.

The following New Members were elected:—Flying Officer Hugh Lewis Pingo Lester, R.A.F.; Flying Officer Louis George Paget, R.A.F.; Capt. Thomas Laurence Purdom (T.F.R.); Albert Edward Thomson; James Percy Ashley Waller; Frank Yonge Urquhart Weldon (late Flight Commander).

### FEDERATION AERONAUTIQUE INTERNATIONALE.

The Meeting of the Bureau of the Federation Aeronautique Internationale was held in Paris on Monday, January 10th, 1921.

Prince Roland Bonaparte was in the chair, and representatives from the following countries were present:—America, Belgium, France, Great Britain (Lieut.-Col. Mervyn O'Gorman, C.B., and H. E. Perrin), Holland, Italy, Sweden, Switzerland.

### SCHNEIDER CUP.

The regulations for this year's Contest were drawn up.

The date for entry was extended to June 1st, and in addition to the Entry Fee, the entrant has to deposit 5,000 francs per machine as a guarantee of the machine taking part. This deposit is returned in respect of all machines taking part in the Contest.

The Contest is divided into three tests:—

1. *Water-tightness Test*:
   For this test the machine must remain afloat for 6 hours, with a full supply of petrol and oil for the whole Contest.
2. *Navigability Test*:
   For this test the machine must fly in a closed circuit over a course of 5 to 10 sea miles. During this test the machine must be taxied on the water over two distances of half a mile.
3. *Speed Test*:
   The Speed Test will be contested over a distance of 200 sea miles in a closed circuit of a minimum distance of 5 sea miles.

Any repairs necessary after the Contest has started may only be carried out at sea, but these repairs must not modify the original condition in which the machine was presented.

Competitors not carrying out the Navigability Test satisfactorily, may start again for a second and last attempt.

The date was provisionally fixed for Sept. 30th, 1921.

### AERIAL DERBY AROUND THE WORLD.

The draft regulations drawn up by the Aviation Commission of the Aero Club de France were presented, but it was decided to defer the consideration until they had been submitted to the Aero Club of America

Several other matters were discussed, including Meteorological Reports, Federation Aeronautique Internationale Brevets, Gordon Bennett Balloon Race.

### FLYING SERVICES FUND.

SUBSCRIPTIONS.

| | | | |
|---|---|---|---|
| Total subscriptions received to November 1st, 1920 .......... | £17,166 | 9 | 6 |
| Collected at C. of E. Parade Services at some R.A.F. Stations | 12 | 19 | 1 |
| Squadron-Leader P. Litherland Teed, R.A.F. (9th con.) .......... | 4 | 4 | 0 |
| | £17,183 | 12 | 7 |

## PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]

### DEATH.

DICKINSON.—On Jan. 4th, in Egypt, of heart failure, Thomas Malcolm, D.F.C., Captain 16th Cavalry, Indian Army, beloved son of the late Captain T. M. Dickinson, R.A., and Mrs. Paget-Davies, 25, Brunswick Terrace, Hove, Sussex, aged 27. Cabled officially. Indian papers, please copy.

### MARRIAGES.

ARONSON—HART.—On Jan. 12th, 1921, at the Hampstead Synagogue, Dennington Park Road, N.W., by the Rev. A. A. Green, assisted by the Rev Stolof, Capt. J. G. Aronson (late R.A.F.), Nairobi, to Netta Adelaide, younger daughter of Mr and Mrs. M. A. Hart, of Alexandra Mansions, N.W. (B. E and South African papers, please copy.)

DE BURGH—SHARP.—On Jan. 5th, at Trinity Church, Sissinghurst, Flying Officer Desmond Herlouin de Burgh, A.F.C., R.A.F., only son of Colonel Ulick de Burgh, C.B., to Norah Dorothy, younger daughter of the late Captain R. G. A. Sharp and Mrs. Sharp, of Sissinghurst Grange.

McALISTER—CARRUTHERS.—On Jan. 5th, at Vancouver, Major Angus McAlister, R.A.F., to Elsie, youngest daughter of the late James Richardson Carruthers and Mrs. Carruthers, 15, Bowmont Gardens, Glasgow.

MARSHALL—COLE.—On Jan. 6th, 1921, at St. John's Church, Chatham, by Canon La Touche, assisted by Rev. H. D. L. Viener, C.B.E., Chaplain-in-Chief R.A.F., Rev. Lincoln Wansbrough, and Rev. J. Walkey, R.A.F., the Rev. Henry Marshall, R.A.F., M.A., son of the late Henry Marshall and Mrs. Marshall ,of Radcliffe-on-Trent, to Evelyn Ruth, youngest daughter of Mr. and Mrs. Cole, 38, Maidstone Road, Chatham.

PATERSON—CAPRON.—On Dec. 15th, Capt. Kenneth Ronald Paterson, late R.F.C. and R.A.F., youngest son of Colonel and Mrs. A. M. Paterson, to Weil Elfrida Cloete, only daughter of Lieut.-Colonel and Mrs. Capron, of The Old Oak Lodge, West Drayton, Middlesex.

HALSE—SPOONER-LILLINGSTON.—On Nov. 22nd, at Queenstown, S Africa, Stanley Seward Halse, late Major, R.A.F., of Hughenden, Halseton, S. Africa, was married to Ethel Loveday, younger daughter of Mr. and Mrs. Percy Spooner-Lillingston, of 4, Hoe Park Terrace, Plymouth.

LISTON—WAIN.—On Dec. 20th, at Colombo, William Duncan Forbes Liston, Indian Police, only son of Mr. and Mrs. Thomas Liston, of 111, Finchley Road, N.W., was married to Nesta Sybil, widow of Capt. W. D. Wain, R.A.F., and daughter of Mrs. R. Forrest, of New Court, Marlow.

### ENGAGEMENTS.

BILES—POMROY.—The engagement is announced, and the marriage will take place shortly, between Flight Lieut. George William Biles, D.F C., Royal Air Force, eldest son of the late George William Biles, of H.M. Treasury, and of Mrs. Biles, and Mary Beatrice, only child of the late Percy Edward Pomroy, and of the late Mrs. Pomroy, of Johannesburg, South Africa, and niece of Mr. W. F. Spafford, and of the late Mrs. Spafford, of Sheffield.

GORDON—ANDERSON.—The marriage between Group-Captain Robert Gordon, C.B, C.M.G., D.S.O., R.A.F., and Alison Margaret, only daughter of Thomas Anderson, of The Grange ,Monifieth, Forfarshire, will take place very quietly in January.

HUSKINSON—DENNEHY.—A marriage has been arranged, and will shortly take place, between Captain Patrick Huskinson, M.C., R.A.F., only son of Colonel and Mrs. Huskinson, of Wath, Pateley Bridge, Yorks, formerly of Farndon, Newark, Notts, and Miss Ada Mary Dennehy, only daughter of the late Major Dennehy, Royal Irish Rifles, and the late Mrs. Dennehy, and great-niece of the late Major-General Sir Thomas Dennehy, K.C.I.E., of Brook Lodge, Fermoy, County Cork.

JENYNS—TODD.—An engagement is announced between Ronald FitzGerald-Jenyns, late Captain, R.A.F., second son of the late Gerald Bulwer-Jenyns, and Mrs. Jenyns, of Bromley, Kent, and Dorothy N. Todd, only daughter of the late Mr. and Mrs. Alfred Todd, of Hampstead.

WHEELER—HAYES.—The engagement is announced of Major Heneage Gibbes Wheeler, late R.A.F., of Bexhill-on-Sea, and Florence Hayes, of St. Louis, U.S.A.

SMITH—BERRY.—The engagement is announced of Sqdn. Ldr. Sidney Smith, D.S.O., A.F.C., R.A.F., son of the late Sidney Smith, of Lowestoft, and Winifred, only child of Dr. H. Poole Berry, O.B.E., T.D., and Mrs. Poole Berry, The Priory, Grantham.

GODFREY—WILSON.—The engagement is announced between Arthur Corfield Godfrey, late Middlesex Regt. and R.A.F., younger son of Mrs. Godfrey, of 29, Whittingshall Road, S.W., and Mary, elder daughter of the Rev. H. E. and Mrs. Wilson, of Little Billing Rectory, Northants.

### BIRTHS.

DALZELL-McKEAN.—At Burghdown, Epsom, Phyllis Mary (nee Warren), the wife of Squadron-Leader L. D. Dalzell-McKean, R.A.F., of a son.

GENGE.—On Jan. 12th, at "The Firs," Westerham, Kent, to Mrs. D. W. Genge, wife of Mr. D. W. Genge (late Lt., R.A.F.), a daughter.

MILLS.—On Dec. 20th, 1920, at Simla, India, the wife of Wing-Commander R. P. Mills, R.A.F.—a daughter.

SKELTON.—On Jan. 16th, at Chatlow, Radlett, to Dorothea, wife of Reginald Skelton, D.F.C.—a daughter

## EMPLOYMENT.

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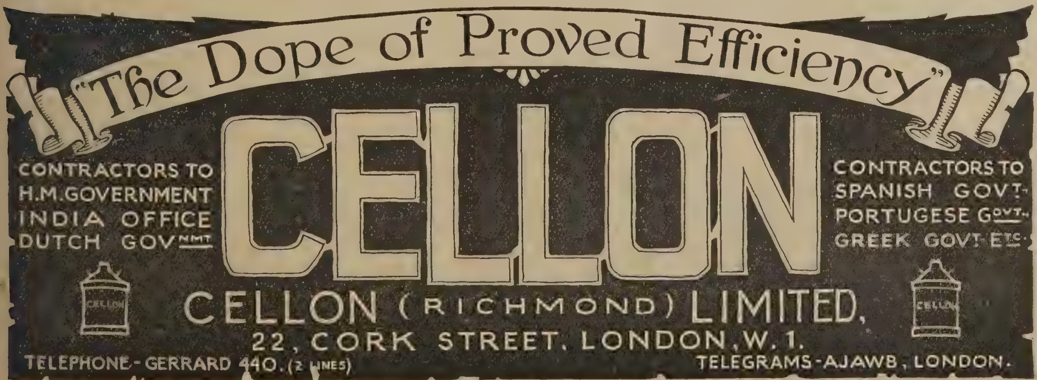
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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... ... *Front Cover & Back Cover*
Armstrong Siddeley Motors, Ltd. ... ... 82
Arrol-Johnston, Ltd. ... ... ... *Front Cover*
Auster, Ltd. ... ... ... ... ... *Front Cover*
Beardmore Aero Engines, Ltd., The *Front Cover*
Bowden Brake Co., Ltd., The ... ... ... 100
Bristol Aeroplane Co., Ltd. ... ... ... 93
Coan, R. W. ... ... ... ... ... ... 93
Cellon, Ltd. ... ... ... ... ... ... 99
Cunard Line ... ... ... ... ... ... 100
Davis Furnace Co., The ... ... ... ... 93
De Havilland Aircraft Co., Ltd., The... ... 82
Fairey Aviation Co., Ltd., The ... ... ... 81
Handley Page, Ltd. ... ... ... ... 77
Kodak, Ltd. ... ... ... ... ... ... 89
McGregor, Gow, & Holland, Ltd. ... ... 93
Metal Airscrew Co., Ltd.... ... ... *Front Cover*
Napier, D., & Son, Ltd. ... ... ... ... 85
New Pegamoid, Ltd. ... ... ... ... 100
Nieuport and General Aircraft Co., Ltd. ... 89
Roe, A. V., & Co., Ltd. ... ... ... ... 78
Saunders, S. E., Ltd ... ... ... ... 91
Short Bros., Ltd. ... ... ... ... *Back Cover*
Titanine, Ltd. *Front Cover & Inside Back Cover*
Vickers, Ltd.... ... ... ... ... ... 87
Westland Aircraft Works... *Inside Front Cover*

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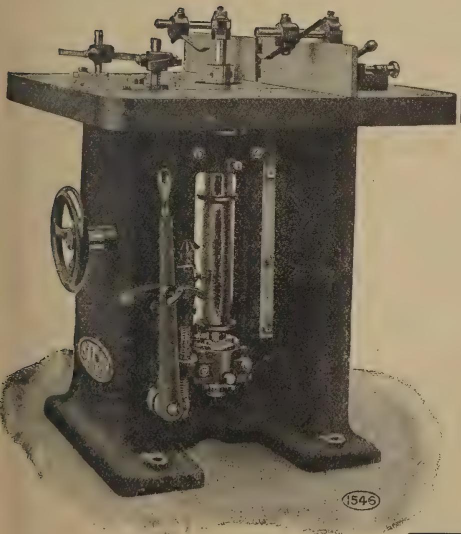

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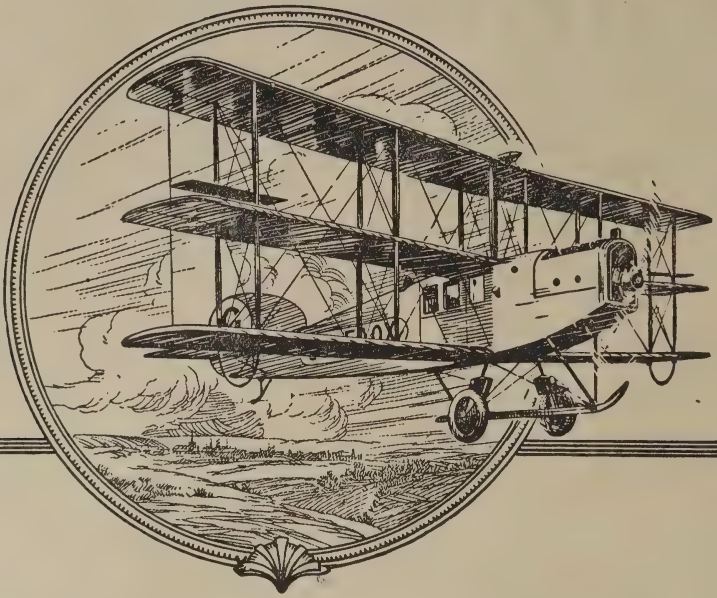

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# THE AEROPLANE

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## ON BIG SHIPS AND AIRCRAFT.

As has been customary in our island's history during the past fifty years or more it is *Punch*, the mirror of the British Nation, which has the *mot juste* on the "Big Ship" controversy. Here is the paragraph :—

> "A man charged with wandering last week said he was a retired admiral. As he admits that he has never written for the Press the police believe he is an imposter."

In a fairly lengthy experience of assorted controversies one can recollect nothing quite so amusing as the arguments which for many weeks past have occupied column after column of the *Times* newspaper. And, one regrets to say, seldom has one seen a less dignified controversy. It would seem quite natural that some of those who have taken part in it should be charged with wandering, mentally if not physically.

Certainly the admiration of the Great British Public for the Navy will not be increased by the correspondence in the *Times*. And still more certainly the respect of junior officers for those of high rank will not be increased, seeing that the admiral on the active list of to-day will be the retired admiral of to-morrow, and so may be expected to take part in the next controversy in a manner similar to that of the quaint old gentlemen who have recently been unburdening their souls in print. Which cannot be good for discipline.

### The Capital Ship of To-day.

Perhaps the most lamentable feature of the whole affair is the lack of comprehension of the relative uses of aircraft shown by all who have been arguing in the *Times*. One aged admiral plumps for big ships, another retorts that torpedoes fired by destroyers, submarines, or aircraft have already rendered big ships obsolete and that the Navy of the future must be under the water or above the water—in other words, our Navy must be submarine and supermarine.

To all of them a "capital ship" means a heavily gunned, heavily armoured battleship. Once the *Dreadnought* was the typical capital ship. Then came the post-*Dreadnoughts* such as the *Queen Elizabeth*. And now we hear of post-Jutland ships such as the *Hood*, which cost £10,000,000, more or less, with material at present high prices, and the productive rate of the British workman at its present low level. With all of them it is purely a matter of armour and gun-armament. And it never seems to have struck any of the dear silly old admirals that aeroplanes are only another form of armament, to be operated by Naval officers and men, just as are big guns and torpedoes.

### The Capital Ship of To-morrow.

Least of all does it seem to have struck any of the aforesaid admirals that it is not the *Hood* which is the capital ship of to-morrow, but the successors of the *Argus* and *Eagle*. Though one is quite ready to recognise that the *Hood* is the type of capital ship for the next five or ten years.

Look at the matter in the light of plain logic. The object of every Navy is to produce a capital ship which will defeat in single combat the best capital ship of any other Navy. We are supposed to have the finest capital ship in the world because the *Hood* can defeat the best ship of any other Navy on sheer gun-power and speed and armour. Moreover, it is said that it would take eight torpedoes to put her out of action.

In other words, the capital ship is the strongest offensive and defensive unit in any given Navy. Offence may be gun-power or bomb power or torpedo power, and defence may be armour or speed or power of submersion.

But, put the *Eagle* and the *Hood* up against one another in mid-ocean, the former armed with twenty-five or thirty torpedo-carrying amphibian aeroplanes and a few sea-scouts, also amphibians, and the latter with her present big guns. What would be the result? Unless the skipper of the *Eagle* happened to be the typical hide-and-brass-bound senior Naval officer the *Hood* would be *spurlos versenkt* before she ever sighted the *Eagle*.

Carry the test a trifle further. Give each of them a screen of destroyers and submarines. *Eagle's* aircraft would have *Hood's* defensive screen sighted and sunk before they so much as had a look at *Eagle*. On the other hand *Eagle's* submarines would at any rate have a sporting chance of getting a shot at *Hood*.

### Important Provisos.

This test, however, must be subject to two provisos if the relative values to the types for the future is to be judged. Firstly, *Eagle's* speed must be equal to *Hood's*, which it is not. And secondly, *Eagle's* aeroplanes must be able to get off her deck in a fairly heavy sea, which they cannot.

That is to say, if we are to evaluate correctly the two types of capital ship we must have an aircraft ship as fully developed as is the *Hood* among big-gun ships. Obviously we cannot have such an aircraft ship for some years to come. And therefore, equally obviously, the *Hood* is the type of the only possible capital ship which we can lay down for building to-day.

### The N.O's. View.

No doubt senior Naval officers and a good many junior Naval officers who read these notes will jeer in the superior manner of the N.O. at a mere civilian who is concerned with aviation presuming thus to air his opinions about the possibilities of Naval aeroplanes. They will judge all Naval aeroplanes by the exploits of the R.N.A.S. at Jutland in 1916, when one unhappy seaplane managed to get off the water, behaved very gallantly, and did no work which actually influenced the action.

One does not mind their jeers. Before the war and in the early days of the war one stood much worse from people in the Army, yet to-day the Army believes as firmly in aeroplanes as does the R.A.F. itself.

One merely points out that despite actual discouragement from the Admiralty in the past and without any recent encouragement from the Air Ministry, those firms which have devoted their attention to the design of sea-going aeroplanes, whether float-seaplanes, flying-boats, deck-fliers, or amphibians, have made quite remarkable progress since those days. The torpedo-carrying amphibian which can fly off the deck of an aircraft-carrier, can make a speed of well over 100 knots, and alight either on deck, on the sea, or on neighbouring land, after dropping her torpedo, is a weapon which very few of the Navy have met. Probably few Naval officers even realise that such machines exist.

Granted that there is plenty of room for improvement, they do exist. But they cannot be improved much further unless somebody, preferably the Admiralty, will spend money on such work.

Therefore one suggests that it would be well if the officers of the British Navy, and the ratings as well, for that matter, were to get it firmly fixed in their heads that the aeroplane of to-morrow is not merely a fast scout which can only be used in fair weather, nor alternatively an amazingly inaccurate bomb-dropper. It is in fact a long-range weapon of extreme accuracy, seeing that a torpedo launched at short range is a very accurate projectile, whether fired from a submarine or by an aeroplane which has carried it a hundred miles from its mother ship.

### A Give-Away.

One of the various comic admirals who have been controverting one another let the cat out of the bag when he asserted that nobody ever became an admiral unless he had commanded a capital ship, and that this accounted for the support secured for the "big ship" side of the argument. After all, it seems reasonable that an officer should not be appointed to command a squadron of battle-cruisers or battleships when he has never commanded anything bigger than flotilla craft.

Unfortunately he omitted to note that none of the present Board of Admiralty has ever commanded a battleship. Lord Beatty's biggest command was a battle-cruiser. Yet their Lordships are in favour of the capital ship of the present-day type.

This distinguished officer may console himself by the thought that in ten or fifteen years' time senior officers of the Navy will be plotting and scheming and intriguing for the command of aircraft ships just as to-day they are intriguing for the command of big-gun ships. For fifteen years hence even the Naval mind will have grasped the fact that the capital ship of the future will be armed with aeroplanes instead of with useless big guns.

### One Line of Argument.

One must confess that when one first began to take a mild interest in this argument one had doubts about the usefulness of the capital ship. But one noticed that Admiral Sir Percy Scott denied flatly that the capital ship could be of any further use, and that he is entirely in favour of submarine and supermarine craft. Now nothing would induce one to be on the same side as Sir Percy Scott, for long experience—dating from his much-boomed and almost useless 4.7 guns in the Boer War—has taught one that specious as his arguments may be and based on sound premisses as they may be, there is always something wrong with his conclusions, or in his method of carrying out those conclusions. For example, was there ever such a farcical affair, or such a lamentable waste of money, as that parody of an anti-aircraft corps with which he was concerned during the war?

Obviously, therefore, Sir Percy Scott must be wrong. It was by starting from this assumption that one arrived at the conclusion that the capital ship must be right, but that the capital ship of the future must be different from the capital ship of to-day. And so one came to the final conclusion that the capital ship of the future must be a very big, very fast ship carrying large numbers of aircraft.

### The Capital Ship in Action.

Consider the present capital ship in action. Her guns are so big that their effective range is limited not by the gun itself, but by the human eye, either because of bad visibility atmospherically or because the enemy's ships are below the horizon when the would-be observer is on the deck of his ship. Yet big as are those guns, they are useless against a ship which can attack with aeroplanes from thirty or forty miles away.

What then is the use of the capital ship of to-day? Is it to bombard coast towns? The answer to that is that even a Naval officer will admit that one gun ashore is worth two afloat. As witness the fact that when once the Germans installed the famous Tirpitz Battery and its supporters along the Belgian Coast none of our ships dared to go within miles of the shore, except to sneak up in a fog, fire a few shells blindly in the direction of Belgium and then bolt before the fog rose and the Tirpitz could get onto them.

How much less chance would a fleet have of getting within gun-range of a coast which was protected by quantities of torpedo-carrying aeroplanes? And many aeroplanes could be bought for the cost of one Tirpitz Battery and the work involved in building it. One shell from one of its guns would pay for an aeroplane.

As against this consider a fleet of aircraft-carriers well equipped with machines which could be used either as torpedo-carriers against hostile ships or as bomb-droppers against coast-towns. Such a fleet could lie twenty or thirty or if necessary a hundred miles off the coast and bomb the said coast persistently. And thus it would do far more damage than any fleet armed with big guns could possibly do, for even a moderately accurate bomber is more accurate than a Naval gun firing at a target ashore. Ask anybody who saw the attempts made by the Fleet to shell Gallipoli or the Belgian coast. And a bomb is more effective against houses than is a shell.

Thus one sees that whether against enemy ships or against an enemy coast a fleet consisting of aircraft carriers, or, as one would prefer to call it, of capital ships armed with aeroplanes, would be far more effective than any fleet of capital ships of to-day's types. Always provided that the aircraft ships were of a type as far advanced as are the capital ships of to-day.

### The Question of Armament.

One does not suggest that guns will become obsolete. The big gun has its uses, especially ashore for long range bombardment at night or in fogs. Also, what is usually called secondary armament will be used against submarines, destroyers, and especially against enemy aircraft.

The "big-gun barrage" as a defence against aircraft sounds very pretty, and it might be useful against the old-fashioned seaplanes and other types of aeroplanes which are the best that the impoverished R.A.F. can afford to give the Navy to-day. But against the aeroplanes which could be built if the money were forthcoming, and if the aeroplane designers could co-operate directly with the Navy in their design instead of being filtered through the Supply and Research Department of the R.A.F., the aforesaid barrage would be a joke.

At the end of it all a ship's chief defence against aircraft will be other aircraft, small fast fighting machines which can be stowed in large quantities in small space. A machine like the little "Bat" takes up very little more room between decks than does a torpedo.

This form of defence is even more necessary for a fleet than for a city ashore. The gunners of the London Air Defence Area, for example, did great execution against enemy aircraft. But the Naval gunner in any fleet is a worse gunner than his compatriot in the artillery of his national army.

Admittedly German Naval guns shoot, or shot, better than ours, but as Naval gunnery goes the British Navy shoots quite well. Nevertheless compared with that of the Royal Regiment of Artillery, Naval gunnery can hardly be said to exist. How much, for example, does the average Naval gunner individually know about allowance for windage, or for the gyroscopic effect of the shell, or for the rotation of the earth as between firing North and South or East and West? It is all done for him from the fire-control station.

Still less does the Naval gunner know about the entirely new science of Anti-Aircraft Gunnery, of which practically all the existing knowledge is possessed by the London Air Defence Area. And precisely how the Navy is going to operate with flank observers on the restricted space of a ship's deck is not quite easy to see.

Apparently what is at the bottom of the weakness of Naval gunnery is that the Naval gunner shoots by sight at a target on his own level and corrects by results observed from his own ship, rather like game shooting. The Army artilleryman has to shoot at targets anywhere above him or below him and almost always has to fire by the map without seeing his target at all. Which is why the Army is more scientific and relies more on the ability of the individual.

Incidentally, aeroplane observation is practically no use to Naval gunners, for (apart from the fact that at Gallipoli and off the Belgian Coast the Navy refused to take any notice of the spotting done for them by the R.N.A.S.) it is practically useless to try and spot for a gun which is itself moving in relation to a moving target.

Therefore, on the whole, it seems that our Navy, or anybody's else's Navy, will be a more efficient fighting machine when its obsolescent big guns are taken away from it and are replaced by properly designed aeroplanes manned and handled by people who know their jobs from A to Z.

### The Modern Method.

One of the amusing people who have taken part in the controversy was a gentleman, apparently late R.N.A.S., who claimed to have served in ships with seaplanes. He butted into the argument to demolish some rather over-optimistic statements by Sir William Joynson-Hicks. He seemed to be of the opinion that a torpedo-aeroplane would drop its tin-fish at 2,000 yards from a ship, and that flying carefully in a straight line at such a distance it would be blown to pieces by the ship's guns.

From his letter one judges that the last seaplanes he saw were those of the slow and stately kind with which two gallant young officers staggered over the Gallipoli Peninsula in 1915 and torpedoed two Turkish ships. At any rate he has obviously no idea of the nature of a modern torpedo attack.

Probably the first time the Navy ever began to think of such things was many months ago when an attack was made by eight machines from Gosport carrying dummy torpedoes against a portion of the Fleet lying off Portland. The Navy knew the attack was coming and watched for it. But it was not made as the Navy expected.

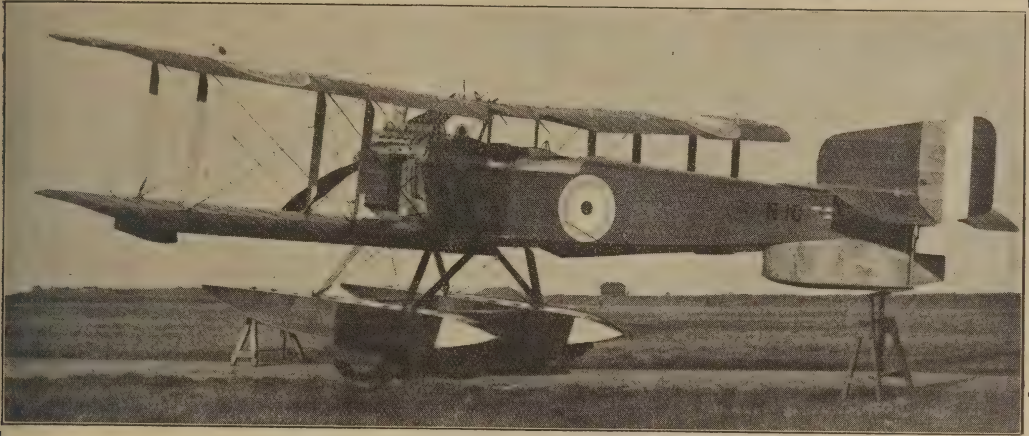
Preceding the eight torpedo machines were two others which dropped a trail of smoke bombs to windward of the ships. And before the smoke cleared the torpedo machines came in down wind at about 130 miles an hour, dropped their torpedoes at a range of a few hundred yards, and shot away over the mast-heads with a few feet to spare before the astonished sailormen had time to rub their eyes.

Granted that the ships were standing still and that they were not using their guns, one holds that it is a fair example of what can be done in war. Gun-fire did not stop the R.N.A.S. raids on the Belgian Coast as it stopped the Naval raids. One cannot help feeling that the big-ship Navy is a trifle apt to overrate the gun and to underrate the aeroplane when it scoffs at the Portland affair as merely playing at aeroplane attacks.

Even without smoke bombs to interfere it is doubtful whether a quick-firer would have much chance of hitting a machine which was spinning down from 7,000 feet to about 50 feet above sea level before straightening out to drop its torpedo. And if four or five such machines attacked a ship

(*Continued on page* 119.)

# A MAKER OF HISTORY.



**The Fairey Amphibian, which performed so well in the Air Ministry Competition, was designed in 1916 as an ordinary Seaplane, was known officially as the N.10, and was the first of the Fairey "Series III," She is here seen in her original form.**

## THE HISTORY OF A SEAPLANE.

She was delivered to the R.N.A.S. in April, 1917; She was on Service till after the Armistice; She was bought back in May, 1919, as a "Disposal" Machine; She was used to carry newspapers from Blackfriars to Thanet; She was used for Experimental Work during the Summer of 1919; She was flown in the Schneider Cup Race in September, 1919, and was the only competitor to return intact under her own power; She was used with experimental Amphibian Undercarriages during the early part of 1920; She did Ferry Work between Southampton and Sheerness; She has survived Nine Different Engines.

In all this work no single Component Part, except the Undercarriage, has been replaced. Fuselage, Wings, Tail-Plane, Rudder, Elevators, Fin, Tail-Float, even the Engine-Bearers, are those originally fitted. The Wings have only been re-covered once, the Tail-Uuit still has the original fabric. The Cock-Pit has been altered to carry one, two, and three people.

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# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

A mechanical fallacy which continually makes its appearance in discussions on flying in a wind and in connection with more mundane phenomena is exposed by Capt. Sayers in an article below.

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The evolution of the Vickers type of amphibian known as the "Viking," from the original type of early 1919 to the latest type now under construction, is described in detail in this issue.

---

Herr Lachmann, the inventor of the German aerofoil which somewhat resembles the Handley Page wing, has in the pages of the German journal, *Flugsport,* taken some objection to Capt. Sayers' exposition of the action of that type of aerofoil.

Herr Lachmann's remarks and an explanation of his difference with Capt. Sayers are published on page 114.

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It is announced that satisfactory results have been attained by Handley Page, Ltd., in the development of an automatic lateral and longitudinal control gear for aeroplanes devised by a French engineer, M. Georges Avelines. Such information as is available is given on page 116.

## A WIDESPREAD FALLACY.

The following letter has been received. As the subject-matter involves a re-assertion of a very widely held fallacy, it seems worth while to devote some consideration to it :—

Sir,—Having read with intense interest the two articles on bird flight, I should like to invade your realm with the following. Climbing without expending one's engine power might be quite possible in the case of an aeroplane, if only the pilot had a sufficiently delicate sense of control, and a variable incidence device; for whereas with a bird the wings are connected by nerves to the brain, the wings of an aeroplane are not part with the pilot.

When a bird, a seagull for instance, intends to climb on the wind, she turns down wind and at the same moment sets the wings at the angle of minimum resistance. This has the effect of increasing the speed by reducing resistance. Then a loss of height occurs. This might be intentional, or due to the lift at this angle not being sufficient to sustain the weight. On these two accounts she has accelerated up above normal flying speed. She then turns up wind and at the same time flexes the wings to the angle of maximum lift. Thereby she is literally jumped upwards, to as much as about fifteen feet in some cases, and while still at above stalling speed she resumes horizontal flight.

The manœuvre is similar to a zoom, but with this difference that whereas the fuselage of an aeroplane moves with the wings, thereby increasing resistance, the fuselage of a bird always remains at the angle of least resistance, thus as during these manœuvres the total resistance in proportion is less than that of an aeroplane, therefore the preliminary dive is less and the ensuing climb more than that of an aeroplane.

Has it ever occurred to any bright person to obtain a few birds that live on the wing, have them stuffed by a cunning taxidermist and test them in a wind channel for lift-drift at various angles of incidence, and then to test the body alone by cutting off the wings? If this were done some interesting figures and curves might result.

(Signed) J. M. Randall.

The letter printed above, and the little brochure written by Col. de Villamil, and referred to in the issue of this journal for Jan. 26th (page 88), both involve a fallacy which is continuously recurrent whenever the subject of soaring flight is discussed.

This fallacy is one which even engineers who would not be led astray by the same fallacy in other connections may be found to subscribe to in this particular connection.

But the fallacy is to be found in other spheres than that of aeronautics, and the subject seems worth while discussing at some length.

The general form in which the fallacy is stated is given by the letter above. In effect the argument is roughly as follows :—

### A Theory of Flight Without Effort.

A bird wishing to rise without effort first flies down wind at his maximum air speed, and he thus acquires a ground speed equal to the sum of the wind speed plus the flying speed. Then the bird turns up wind; the speed through the air required for support remains the same up wind as it was down wind, and therefore the ground speed required for support is now only the difference between wind speed and flight speed, which is less than the original ground speed by twice the wind speed.

At the high ground speed corresponding to flight down wind the bird has kinetic energy relative to the earth greatly in excess of that corresponding to the low ground speed of flight up wind. This kinetic energy cannot be destroyed, unless the doctrine of the conservation of energy is abandoned, and therefore it must be available to lift the bird.

### The Fallacy.

The fallacy lies in supposing that because this excess kinetic energy cannot be destroyed, that therefore it remains attached to the bird. In fact this energy continues in existence but it is transferred from the bird to the air More correctly, this energy never pertained particularly to the bird; it is energy pertaining to the whole moving system comprising both wind and bird and is solely due to the fact that the whole system is continuously moving relatively to the earth at a velocity equal to the wind velocity.

The error involved can be illustrated more clearly by considering certain cases where bodies in motion somewhat more tangible than the air are alone involved.

The conditions of a railway train moving at a high speed along a straight track are fairly familiar to most people, and have frequently been used for the illustration of the theories of relative motion. Even Dr. Einstein has found the train a useful illustration, and it serves admirably for the present purpose.

### Concerning Collisions in Railway Trains.

Imagine then a train moving at a uniform speed of say 60 m.p.h. on a straight track. A passenger sitting in this train facing the engine throws a ball at the wall of the compartment opposite him with an additional speed of 10 m.p.h. Assuming the ball and the wall of the compartment to be perfectly elastic and the air resistance to the ball's flight to be negligible the ball will strike the wall at 10 m.p.h. and will bounce back from it at 10 m.p.h., both relatively to the wall which is part of the train.

But the velocity of the ball after it is thrown is, relatively to the earth, the sum of its own and the train speed, *i.e.,* 70 m.p.h. After the rebound the velocity relative to the earth has fallen to the difference of these speeds—*i.e.,* to 50 m.p.h. The kinetic energy of the ball is proportional to its mass and to the square of its velocity—and as the mass is constant the change in velocity alone may be used to measure the energy. In a ball-mile hour system of units the KE of the ball relatively to the earth according to the account given above has fallen from $(70)^2$ or 4,900 to $(50)^2$ or 2,500.

If one is to assume that this cannot have happened, but that the ball retains the original kinetic energy of 4,900 units, its speed relative to earth must still be 70 m.p.h. though in a reversed direction. Consequently its speed relative to the train must now be $70+60=130$ m.p.h.

### A REDUCTIO AD ABSURDUM.

If this is to be accepted as the truth it must logically follow that it cannot be true except in virtue of the particular velocities of this particular case, and that if the ball is thrown at 5 miles per hour train speed—or 65 m.p.h. ground speed—it will bounce back at 65 m.p.h. ground speed—125 m.p.h. train speed. And, finally, if it is thrown at the compartment wall at 0 m.p.h. train speed, or 60 m.p.h. ground speed, it must still return at 60 m.p.h. ground speed, or 120 m.p.h. train speed. Now it cannot be conceived that merely being in contact with a wall moving at 60 m.p.h. can supply to the ball a velocity equal to that of the wall but in the opposite direction, and so the theory that the kinetic energy of the ball remains constant in reference to the earth must be abandoned.

When the ball strikes the wall a retarding force is exerted on it by the wall owing to the fact that the wall is elastically deformed. This retarding force brings the ball to rest and then accelerates it in a direction opposite to that with which it struck the wall. During the period in which the ball is brought to rest the wall is deflected forward in the direction of the train's motion, and work is done by the ball on the wall. The ball loses kinetic energy to the wall. During the second period of contact the wall returns to its original form, pushing the ball with it, and imparts kinetic energy to the ball. The amount of energy represented by the work done by the ball in deforming the wall, and that represented by the work done by the wall while recovering its form and accelerating the ball towards the rear of the train, are both equal in amount but opposite in their direction of action.

But the force acting on the ball during the whole time of contact is always acting in one direction, that is towards the rear of the train. Therefore an equal and opposite force acts on the wall during that period and is transmitted by the wall to the structure of the train. And that train is moving. During the period of contact the train will have moved a definite though small distance.

### CONCERNING WORK AND LEANING ON FENCES.

Whenever a force acts on a body which moves work is done. If I lean against a fence with a force of 20 lb. and the fence does not move I do no work on the fence. If, however, the fence falls while I am leaning on it I do work on that fence to the extent of 20 lb. multiplied by the distance through which that fence falls while I am leaning. This is equally true whether the fall is entirely due to my leaning upon it or whether the wall was already in process of falling when I started leaning.

Therefore because the train moves while the ball is exerting a force on it the ball does work on the train to an amount represented by the product of the mean value of this force multiplied by the distance the train moves while the force is exerted.

The faster the train moves the greater this distance will be and the more the work done on the train by the force of impact of the ball with the wall; and in any case it will be found that the work done on the train is exactly equal in amount to the energy which has been lost by the ball. Actually this energy has the effect of slightly accelerating the train.

A ball bouncing from a wall does not exactly represent the case of a body which reverses its direction by moving through an arc of a circle of 180 deg., as in the case of the turning bird.

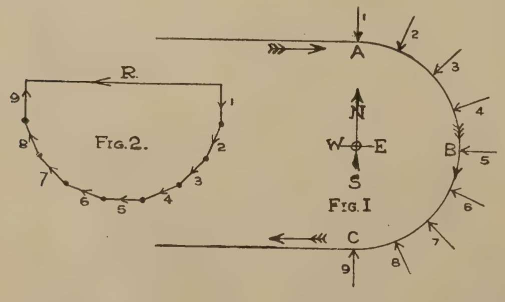


FIG. 2.

FIG. I

Fig. 1 represents the path of a body which was originally moving with a uniform velocity from W to E, but which from A to C is constrained to move in a semicircle, finally emerging at C with a velocity equal in magnitude to that which obtained at A, but reversed in direction to E. to W.

At both A. and C the body has no velocity towards either N or S. It has been moved bodily from N to S through the distance A—C, and therefore must have first been accelerated and then retarded to equal extents in a southerly direction.

To accelerate it from N to S, between the positions A and B, a force must have acted from N to S on the body. To retard the body from its maximum velocity southward at position B to zero velocity southward at position C a force in the opposite direction must have acted. The sum total of these two sets of opposed forces must be zero, otherwise the body at C would have some resultant velocity in the N and S direction.

Considering now the direction W to E, at the position A the body has a velocity towards E. This velocity is steadily decreased till at B there is no velocity in this direction, but solely one southward. From B to C this easterly velocity is still further decreased till finally at C the velocity towards E has become negative and equal in magnitude to that at the position A. That is, if the velocity eastward at A is V, at C it has become —V eastward or V westward.

Therefore a force must have been acting on the body in a continuously westerly direction to produce the observed retardation towards the east, which may equally be considered an acceleration towards the west.

Fig. 2 shows graphically that all the little centripetal forces 1 to 9 sum up to a westerly resultant R.

The nature of the medium which applies the force to the moving body and thus causes its change of direction is absolutely immaterial. If the body is a railway truck and a curved line of rails acts as the guide a resultant force from E to W is applied by the rail to the truck, and a reaction from W to E is applied to the rail by the truck.

If the body be a mass of iron and the cause for the reversal of movement is a magnet situated at O, or if the body be a bird and the reversal of movement is due to a reaction developed between the wings of the bird and the air, the same forces are developed and their magnitude depends solely on the mass of the moving body and its velocity relative to the body which causes the change of direction.

It is now possible to answer the question, "What happens to the kinetic energy which appears to be lost by a bird when it turns from down wind to up wind?"

The bird will be considered to be of mass M, and to have a steady air speed v. The wind speed is also steady and of magniture w.

Flying down wind the bird turns through 180 deg. to face the wind, taking a time T to complete the manœuvre. This turn is the result of a force acting on the bird's wing, due to the air in which the flight occurs. This force is

$$F = \frac{M}{g} \cdot \frac{\Delta V}{T}.$$

The total change of velocity $\Delta V$ relatively to the air $= 2v$, and therefore :—

$$F = \left(\frac{M}{g} \cdot \frac{2v}{T}\right).$$

The reaction of the bird's wing on the air is also a force equal in magnitude to F, but in the opposite direction.

But the wind, and with it the bird, have both the wind velocity w, and during the time T this velocity results in a movement of bird and air through a distance Tw, and work is done to the extent

$$Tw \cdot F = Tw\frac{M}{g} \cdot \frac{2v}{T} = 2\,\frac{Mwv}{g}.$$

This work is negative for the bird, and positive for the air. That is, the bird expends energy on the air.

As this expression for work done on the air does not contain T, it follows that the work done on the air by the bird in turning is not affected by the time taken in turning.

Before turning the bird was moving over the ground at a speed of $(v+w)$, and therefore the kinetic energy of the bird relative to the ground is

$$E_0 = M\frac{(v+w)^2}{2g} = M\frac{v^2+2vw+w^2}{2g}.$$

After turning, the bird's energy becomes

$$E_1 = M\frac{(v-w)^2}{2g} = M\frac{v^2-2vw+w^2}{2g}.$$

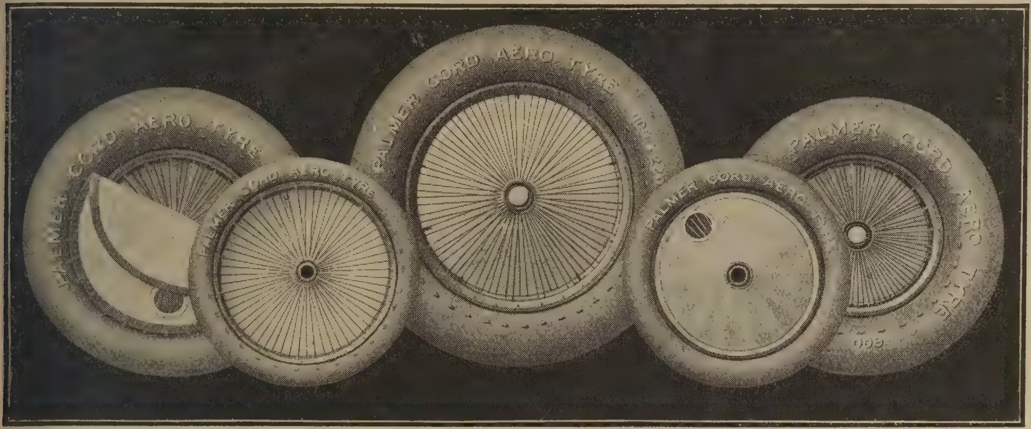
The difference $E_0$—$E_1$ is :—

$$M\frac{4vw}{2g} = 2\,\frac{Mvw}{g}$$

and this difference is exactly equal to the work done on the air by the bird in turning. Obviously the kinetic loss by the bird has been merely transferred to the air.—W. H. S.

# PALMER

# LANDING WHEELS & TYRES



## STANDARD SIZES

| Tyre Sizes | Wheel No. | Hub | | Track Line |
|---|---|---|---|---|
| | | Length | Bore | |
| | | m/m | m/m | m/m |
| 300×60 | 16 | 111.12 | 25.4 | Central |
| „ | 17 | 72.39 | 12.7 | Central |
| 450×60 | 30 | 89. | 31.75 | Central |
| „ | 138 | 130. | 38.09 | Central |
| 575×60 | 21 | 160. | 28. | Central |
| „ | 34 | 150. | 31.75 | 104/46 |
| „ | 111 | 150. | 38.09 | 104/46 |
| 650×65 | 78 | 178. | 44.45 | 132/46 |
| „ | 79 | 178. | 44.45 | Central |
| „ | 100 | 178. | 38.09 | 132 46 |
| „ | 101 | 178. | 31.75 | 132/46 |
| 600×75 | 21 | 160. | 28. | Central |
| „ | 34 | 150. | 31.75 | 104/46 |
| „ | 111 | 150. | 38.09 | 104/46 |
| 700×75 | 78 | 178. | 44.45 | 132/46 |
| „ | 79 | 178. | 44.45 | Central |
| „ | 100 | 178. | 38.09 | 132 46 |
| „ | 101 | 178. | 31.75 | 132/46 |

| Tyre Sizes | Wheel No. | Hub | | Track Line |
|---|---|---|---|---|
| | | Length | Bore | |
| | | m/m | m/m | m/m |
| 700×100 | 77 | 178. | 44.45 | 132/46 |
| „ | 92 | 185. | 55. | 135/50 |
| „ | 95 | 185. | 55. | Central |
| „ | 96 | 178. | 55. | 132/46 |
| „ | 99 | 178. | 38.89 | 132/46 |
| „ | 112 | 150. | 38.09 | Central |
| 650×125 | 119 | 178. | 55. | 132/46 |
| 750×125 | 77 | 178. | 44.45 | 132/46 |
| „ | 92 | 185. | 55. | 135/50 |
| „ | 95 | 185. | 55. | Central |
| „ | 96 | 178. | 55. | 132/46 |
| „ | 99 | 178. | 38.89 | 132/46 |
| „ | 112 | 150. | 38.09 | Central |
| 800×150 | 82 | 185. | 55. | 135/50 |
| „ | 85 | 185. | 55. | Central |
| „ | *36 | 185. | 55. | 135/50 |
| „ | *40 | 185. | 60.32 | 135/50 |
| 1000×150 | 131 | 220. | 66.67 | Central |
| „ | 102 | 185. | 55. | 125/60 |

| Tyre Sizes | Wheel No. | Hub | | Track Line |
|---|---|---|---|---|
| | | Length | Bore | |
| | | m/m | m/m | m/m |
| 1000×150 | 141 | 250. | 80. | Central |
| „ | 201 | 185. | 60.32 | 125/60 |
| „ | 209 | 185. | 55. | Central |
| „ | 210 | 185. | 60.32 | Central |
| 1000×180 | 148 | 220. | 80. | Central |
| „ | 149 | 185. | 55. | Central |
| 900×200 | 107 | 185. | 55. | Central |
| „ | 108 | 185. | 55. | 125/60 |
| „ | 128 | 220. | 66.67 | Central |
| „ | 137 | 250. | 80. | Central |
| „ | 202 | 185. | 60.32 | Central |
| 1100×220 | 134 | 220. | 66.67 | Central |
| „ | 136 | 250. | 80. | Central |
| 1250×250 | 133 | 250. | 80. | Central |
| 1500×300 | 115 | 304.8 | 101.6 | Central |
| „ | 126 | 304.8 | 152.4 | Central |
| 1750×300 | 139 | 400. | 152.4 | Central |

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DINE.

# THE EVOLUTION OF THE VICKERS "VIKING" AMPHIBIAN.

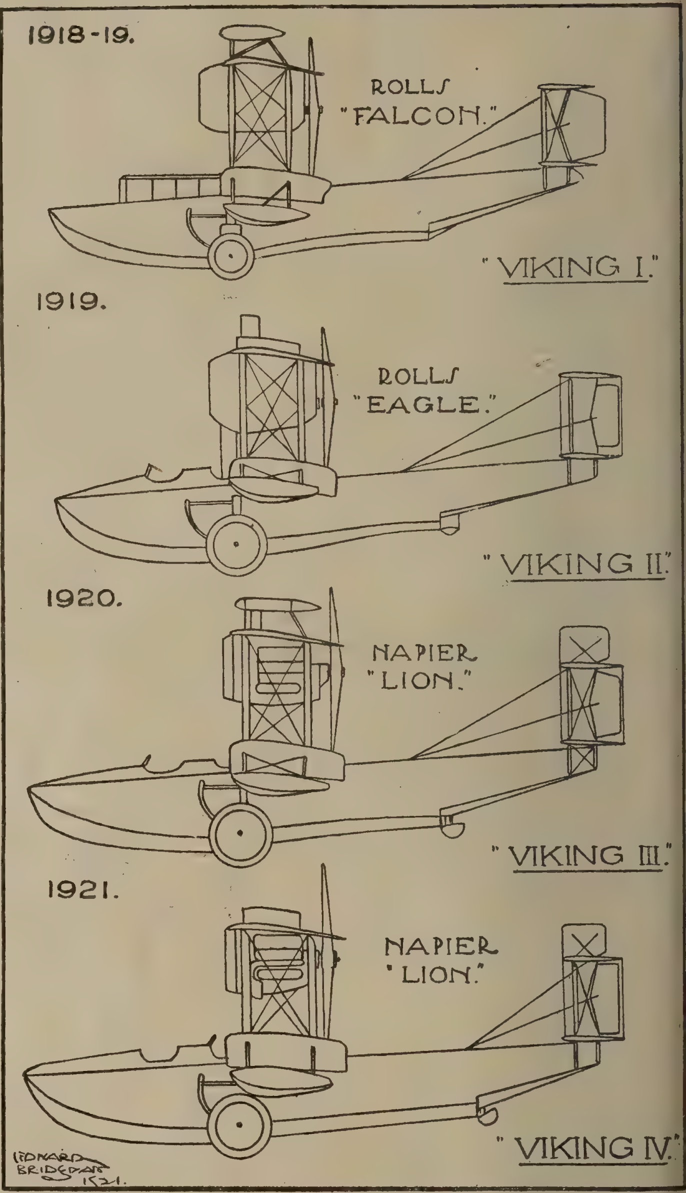
The "Viking" Amphibian, Mark I, of 1918-19 is shown in the top figure in side view. This machine had a total weight of 3,600 lb., carried 500 lb. of useful load at a speed of 104 m.p.h., and climbed 6,000 ft. in 12 min. Her range at 85 m.p.h. was 340 miles with a "Falcon" Rolls engine of 275 h.p.

The Mark II "Viking" of late 1919 differed from the original in that the engine became an "Eagle" of 360 h.p., the hull was modified, the wheel base widened, the wing surface was increased, the glazed cabin was removed, and a third rudder was fitted between the two fins. Details of the undercarriage were improved, and a steerable tail-skid-rudder oleo-pneumatically sprung was fitted. These modifications increased the total weight to 4,600 lb. The useful load remained 500 lb., the speed rose to 108 m.p.h. and the climb to 6,000 ft. in 10 min. The range at 85 m.p.h became 460 miles.

The Mark III "Viking" was the winner of the Air Ministry Competition for Amphibians, 1920. A Napier engine of 450 h.p. replaced the Rolls of earlier models, the surface was still further increased, modifications were made in the hull to reduce the spray, and the arrangement of fin area was modified with a view to reducing the turning effect of the airscrew slipstream. These alterations increased the total weight to 4,900 lb., the useful load increased to 700 lb., from which it may be seen that the machine itself increased very slightly as to weight, the speed became 121 m.p.h., and the climb to 6,000 ft. was accomplished in 5.2 min. The range was 420 miles at 90 m.p.h.

The Mark IV type has a hull of increased beam, folding wings of increased surface, redesigned wing-tip floats, and the pilot's controls have been moved from the front to the second cockpit. The total weight has increased to 5,600 lb., the useful load to 1,090 lb., the speed is now 119 m.p.h., and the climb to 6,000 ft. takes 7.35 min. The range at 90 m.p.h. is now 480.

It will be seen that there has been a steady rise in the ratio of useful load to total weight and a marked all-round improvement in performance throughout the series.



The "Viking Mark IV" is the latest of the stages in the evolution of the Vickers amphibian aircraft. The first "Viking" (Mark I) was designed at the end of 1918, and had taken the air in February, 1919, and proved that the designer had successfully solved the main problems of producing an aircraft capable of alighting or taking off at will upon either land or water.

"Viking Mark II" was completed at the end of 1919. In all essentials the lines of the first "Viking" were followed, but an engine of greater power was fitted, the Rolls "Eagle" of 350 h.p. taking the place of the "Falcon" of 250 h.p. The surface was increased, and a number of detailed improvements were made.

"Viking Mark III" was produced in 1920, and is well known as the winner of the Air Ministry's competition for commercial amphibians. Here again no drastic alterations in the design were found necessary. A still more powerful engine—the Napier of 450 h.p.—an increased surface, an improved hull, a modification of the fin arrangements, and a decided increase in useful load, and in all round performance, distinguished the type from its predecessors.

For 1921 Vickers Ltd. have produced the Mark IV—still another step along the path indicated by the experience with the first three types.

The diagram attached gives in a graphic form the history of the "Vikings" to date, and shows how little modification has been made in the basic design.

The "Viking Mark IV" differs from the Mark III most noticeably in the fact that it is fitted with folding wings—thus effecting a considerable saving in stowage space. In addition to this the span, and the wing surface, have been increased, the boat hull has an increased beam, and the controls have been removed from the front to the after cockpit.

The hull remains in form and material similar to that of

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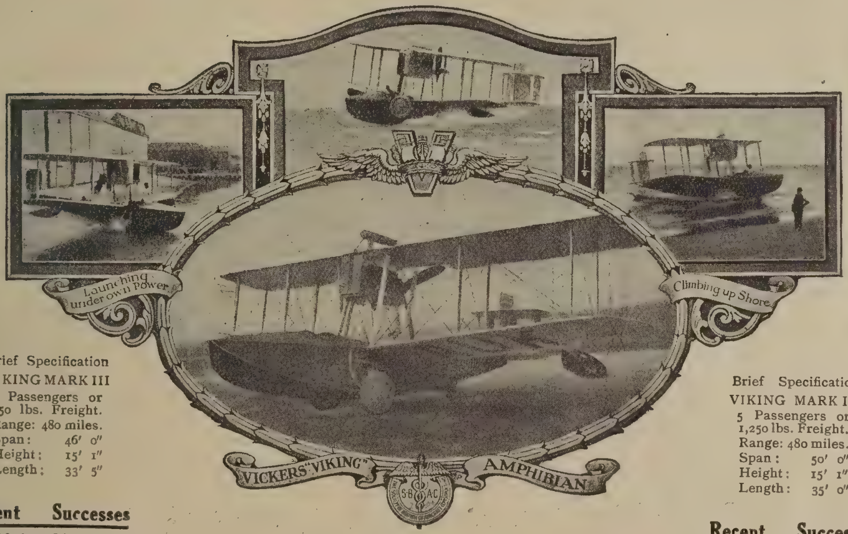

Brief Specification
VIKING MARK III
5 Passengers or
750 lbs. Freight.
Range: 480 miles.
Span: 46′ 0″
Height: 15′ 1″
Length: 33′ 5″

**Recent Successes**

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

1. Shortest time in "unsticking" from water.
2. Fastest time over a given circuit.
3. Climb to 1,000 metres.
4. Altitude with full load.

Brief Specification
VIKING MARK IV
5 Passengers or
1,250 lbs. Freight.
Range: 480 miles.
Span: 50′ 0″
Height: 15′ 1″
Length: 35′ 0″

**Recent Successes**

The Vickers Viking was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION September, 1920

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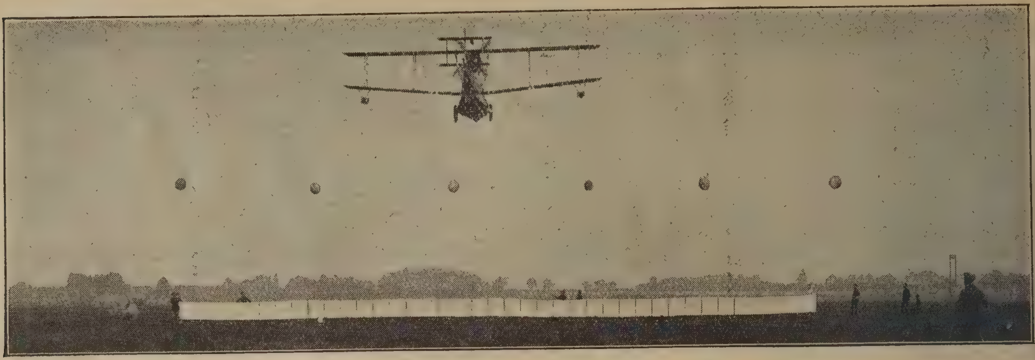


**The Vickers "Viking Mark III" at the Air Ministry Competitions at Martlesham Heath. The machine is passing over the balloons which served to indicate the obstacle over which landing and taking-off were to be effected.**

antecedent types. It is built of timber, planked with "Consuta," and fitted with two steps. The retractable undercarriage consists of two telescopic sprung struts, one at each side of the hull, pivoted at the upper end, and carrying landing wheels at the other end, which can be swung forwards and upwards about the top pivot by a pinion working in a rack forming a quadrant of a circle. The tail skid for land work is fitted at the rear step, and consists of an oleo-pneumatically sprung steel shoe, which also serves as a water rudder when afloat.

The wings are of biplane form, with a large dihedral angle on the bottom pair alone. The upper wing is in five sections, a centre section over the engine, an inner fixed section on each side, and two outer folding sections. The lower wings are in four sections, two fixed to the hull, and two folding outer sections. Outside the centre section struts there are two pairs of interplane struts per side, and folding occurs from the first of these pairs of struts.

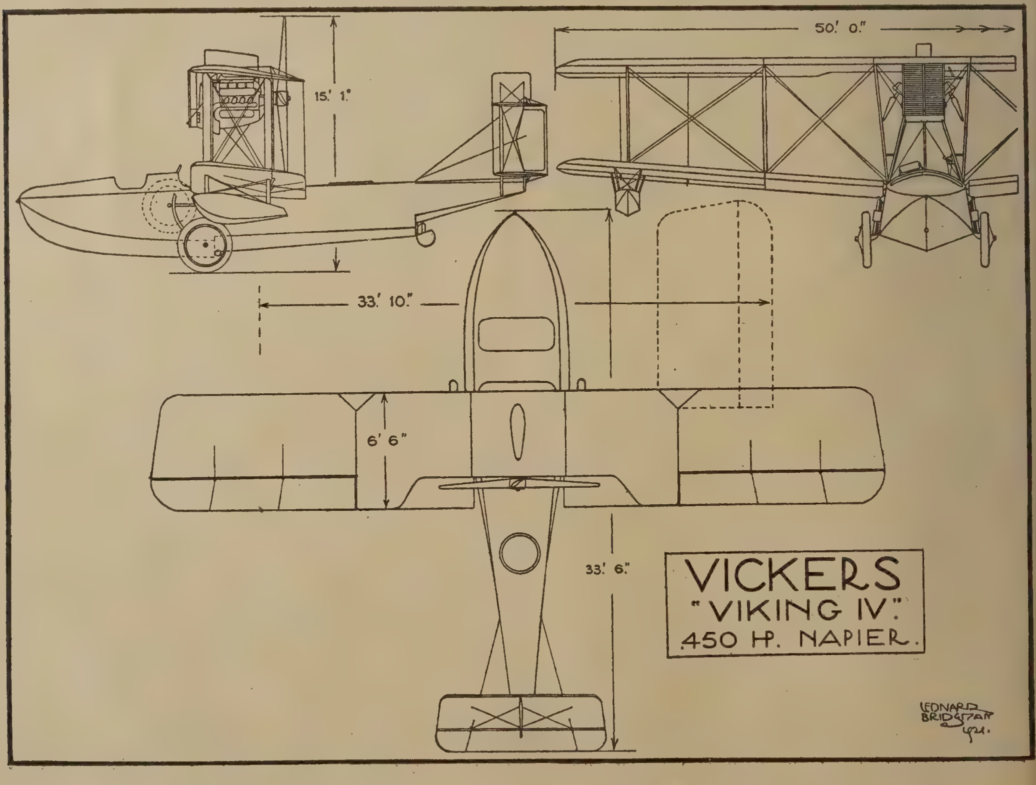
Unlike the majority of folding wings, these are pivoted about the front spar, and fold forward, instead of backward. Owing to the necessary forward projection of the boat hull, this arrangement adds little or nothing to the overall length folded, and has the advantage that even a failure to lock the wings in their opened position cannot cause them to fold in the air.

Normally seats for five are fitted, two passengers forward and one aft, with pilot and mechanic in the central cockpit. By removing three of these seats some 75 cubic feet of stowage space becomes available for cargo.

For warlike purposes it is obvious that the fore and aft cockpits may be made to bristle with guns, or may provide space for wireless gear and other necessary appurtenances.

With the modifications introduced the Mark IV has a capacity for 1,070 lbs of paying load, as against 700 in the Mark III type, with only a very small drop in top speed and in climb, while the range of action remains unaltered. This refers to the type fitted with the Napier engine.

The Mark IV may be fitted as an alternative with the Rolls-Royce "Eagle" engine. Carrying the same useful load, the reduced engine power pulls down speed and climb to



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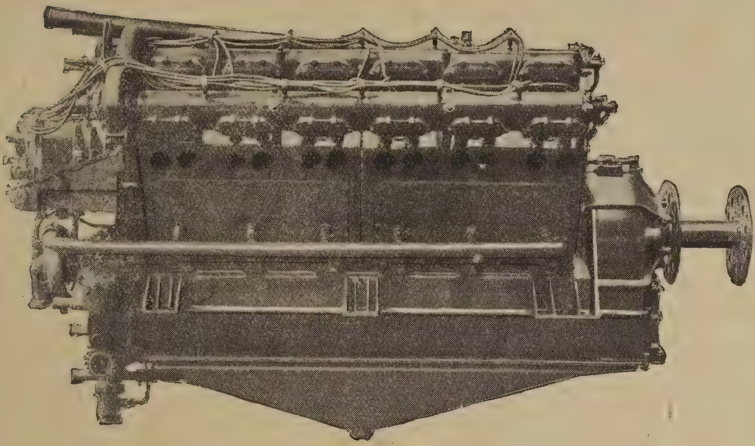

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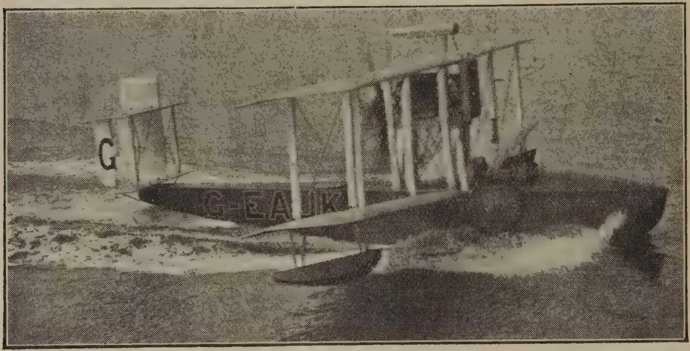

**THE WINNER OF THE FIRST PRIZE FOR AMPHIBIANS, AIR MINISTRY COMPETITIONS, 1920.—The Vickers "Viking Mark III" at Felixstowe during the trials. The very slight wash produced by the hull and the absence of any spray around the retracted wheels shows that the marine part of the amphibian problem has been satisfactorily solved.**

some extent, but makes no appreciable difference to the range and cruising speed.

The main dimensions and particulars of this machine are given in the following table :—

Specification of the Vickers "Viking Mark IV."

| | |
|---|---|
| Weights— | |
| Empty, with water | 3,728 lb. |
| Petrol—(80 gall.) | 568 lb. |
| Oil—(6 gall.) | 54 lb. |
| Human or commercial load (inc. pilot) | 1,250 lb. |
| Total | 5,600 lb. |
| General Characteristics— | |
| Overall length | 33 ft. 6 in. |
| Overall height (on wheels) | 15 ft. 1 in. |
| Span | 50 ft. |
| Span (folded) | 33 ft. 10 in. |
| Length (folded) | 35 ft. |
| Chord | 6 ft. 6 in. |
| Gap (at centre line) | 7 ft. 7 in. |
| Incidence of main planes | 6 deg. |
| Dihedral, top plane, | 0 deg.<br>0 deg. |
| Dihedral of bottom plane | 5 deg. |
| Area of main planes | 594 sq. ft. |
| Loading per sq. ft. (594) | 9.4 lb. |
| Loading per h.p., (450) | 12.45 lb. |
| Performance (full load) (Napier Engine)— | |
| Full speed (sea level) | 119 m.p.h. |
| Time to 6,000 ft. | 7.35 min. |
| Full speed at 6,000 ft. | 114.5 m.p.h. |
| Range at 6,000 ft. at full speed | 350 miles |
| Range at 6,000 ft. throttled to 90 m.p.h. | 480 miles |
| Absolute ceiling | 18,250 ft. |
| Landing speed | 50 m.p.h. |
| Performance (Rolls-Royce "Eagle" Engine)— | |
| Full speed (sea level) | 102 m.p.h. |
| Time to 6,000 ft. | 15.8 min. |
| Full speed at 6,000 ft. | 96 m.p.h. |
| Range at 6,000 ft. at full speed | 380 miles |
| Range at 6,000 ft. throttled to 90 m.p.h. | 450 miles |
| Absolute ceiling | 11,000 ft. |
| Landing speed | 50 m.p.h. |

## A GERMAN THEORY OF THE HANDLEY PAGE WING.

Following the publication by *Flugsport* of the abstract of a patent application by Herr Lachmann, covering a wing very similar to the Handley Page arrangement, Herr Lachmann has contributed to the German journal a note on the theory of this type of wing which is here quoted in abstract :—

". . . . It is not claimed that the extract from the patent specifications and the reply to the objection raised relative to the expected equalisation of pressure, are scientific. The narrow limits of an application for a patent do not lend themselves to this, moreover a certain veiling of the idea is to the interest of the inventor.

"No correct explanation of the course of the air-flow is given by the common theory of a vacuum on the upper surface, which cannot be accepted scientifically Even W. H. Sayers' article in The Aeroplane does not give a clear and accurate explanation. In order to understand the process a knowledge of the basic principles of the theory of fluid motion is required.

"According to the theory of fluid motion, the motion of a fluid flowing in a space about an obstruction can be described as consisting of cyclic motion about the centre body superposed on to the motion of translation. In this case the body experiences a pressure at right angles to the direction of motion towards the side where the velocity of the circular motion is added to that of the motion of translation, because on this side there prevails a lower static pressure, corresponding to the increased velocity, than on the other side.

"This is clear from the hydrodynamic principle : the sum of the static pressure and the velocity head is constant at any point "

[Herr Lachmann here demonstrates that in consequence of this assumption of a cyclic flow round an aerofoil the velocity below the wing is lower than that above it, and that therefore the pressure below the wing is greater than that above it.—Ed.]

"The air-space between the upper surface of an inclined plate and the discontinuity surface is not rarefied, but filled with detrimental work-absorbing eddies.

"A similar condition occurs with a cambered profile when the angle of incidence is increased beyond the critical value.

"The rapid decrease in lift which occurs with increased angle . . . is the consequence of the formation of these eddies which are due partly to the angle of incidence and partly to the leading edge outline and the value of the velocity.

"With a divided wing profile the course of the flow is entirely different, and the formation of detrimental eddies is avoided. With any angle of incidence the streamlines flow close round the curve of the profile, and therefore the outflow is free from eddies.

"An equalisation of pressure cannot occur as the pressure on the upper surface and that on the under surface of the wing are functions of the velocities over and under the wing and the lift depends on the difference between the under and upper pressures. A decrease in upper velocity is not to be feared, as with sufficient distance between the detached surfaces the whole unit can be considered as a staggered multiplane with independent detached surfaces.

"The cross-section of the gaps is so chosen that the upper channel is narrower than the bottom opening. According to the equation of continuity an increase in the velocity head of the air stream issuing from the upper channel occurs. (Venturi tube principle.) Owing to the centrifugal acceleration of the stream lines caused by the cambered under surface of the detached profiles, new fractional pressures occur which are added to the total pressure.

"Owing to the conditions of the Peace Treaty it has not been possible in Germany to produce an actual proof by means of practical tests on an engine-driven aeroplane. It is well known that in aircraft construction the results of tests on models cannot always be applied to full-size craft without modifications.

"The tests on the Handley Page wing confirm theoretical expectations, although the arrangement of a forward auxiliary aerofoil as tested on the D.H.9 is a very incomplete solution, so that the results of the test are open to criticism.

"According to the British reports in the *Engineer* (p. 421) and The Aeroplane, burbling occurs only at a value of the lift 50 per cent. above the normal. With a series of six detached surfaces, which corresponds approximately to the aerofoil forming the subject of my application for a patent, an increase in lift of 200 to 300 per cent. is to be expected.

"It is to be hoped that this problem will also be taken up by German science after the German priority of the idea has been established."

### An Explanation.

Herr Lachmann's difference from Capt. Sayers on this subject is purely formal. Capt. Sayers attributes the lift of an aerofoil to the downward deflection of the air affected by the aerofoil, and the increased lift of the Handley Page wing at angles above stalling point to the fact that it deflects downwards air which would otherwise escape from that influence. Now it can be shown that in the ideal incompressible fluid of hydrodynamic theory it is impossible to impress upon a

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stream of fluid of sensible dimensions an acceleration at right angles to its original direction of flow without causing a variation in velocity across the section of the stream, unless the acceleration acts uniformly upon the whole system comprising that stream.

A downward acceleration of the type demonstrably caused by an aerofoil in a uniformly flowing stream necessarily implies that the velocity of the lower section of the deflected stream becomes less than that of the upper section of that stream and the differences in pressure head which arise from this difference of velocity sum up to a total force equal and opposite to that required to produce the acceleration of the mass of air which forms the affected stream.

Hence Herr Lachmann's explanation that the increased lift is due to the slots in the wing increasing the effective velocity difference above and below the wing is merely another method of stating that the effective downward acceleration of the air stream is increased, as stated by Capt. Sayers.

The theory of a cyclic current round the aerofoil is a convenient method of taking account of the internal differences of velocity in the stream which are caused by that obstacle when attempting a mathematical solution of the problems of fluid reactions, but scarcely adds greatly to a clear representation of the phenomena involved.

## A NEW AUTOMATIC CONTROL.

For some time past the Handley Page firm have been carrying out experiments with an automatic controlling device designed to relieve pilots of the work of continuously maintaining their machines on an even keel.

On the conclusion of a series of satisfactory tests some meagre details of the scheme adopted have been issued by the firm for publication.

Briefly, the system is described as follows :—

The rudder is left to the control of the pilot

The elevator and aileron controls are operated by some form of servo-motor which is energised by compressed air supplied through the medium of fan-driven pumps and a storage reservoir in the fuselage.

The valves admitting air to the servo-motors and so operating the controls are opened or closed, presumably through the agency of electromagnets, by electrical means. The electrical circuits involved are in their turn controlled by a vessel partly filled with mercury and fitted with contacts such that movement of the mercury due to rolling or pitching of the aeroplane closes a circuit which will ultimately cause the controls of the aeroplane to be moved in such a way as to correct the original movement of the aeroplane. Arrangements are provided so that the pilot can cut out the automatic control at will.

The device is attributed to a French engineer, M. Georges Avelines.

It is stated that a Handley Page was flown for two hours consecutively under the sole control of this device, and that 14 Handley Page bombers have been fitted with the Avelines control for the R.A.F. after exhaustive tests.

It should be pointed out here that unless the description now released for publication conceals some of the essential features of the device it consists solely of a mercury inclinometer acting as a relay, and that it is exactly similar in principle to the many types of pendulum stabilisers which have from time to time been suggested.

Being a pendulum, the device is subject to the effects of acceleration and its operation must depend on the pilot's ability to maintain a steady course.

In a vertical turn, a clean loop, and possibly a spin, the mercury may remain level relatively to the machine and do nothing to correct the disturbance.

## A NEW RIGID AIRSHIP.

It is stated by the local Press that R.36 is now practically completed at the airship works of Wm. Beardmore, Ltd., at Inchinnan, and may be expected to make a trial flight within the next few weeks.

R.36 was under construction at the time of the Armistice, and, like other rigids in a similar stage of progress, work was suspended thereon. Eventually it was decided that she should be completed as a passenger-carrying ship.

As far as can be ascertained R.36 is of a class intermediate between R.34 and R.38. The diameter is the same as that of R.34, the overall length is about 30 ft. greater, and the capacity of about 2,100,000 cu. ft. instead of 1,950,000 of the R.34.

R.36 when complete is expected to play an important part in the experimental service between Egypt and England which the Department of Civil Aviation hopes to operate.

## ANOTHER HELICOPTER.

According to certain Paris journals, a new helicopter—due to the mental activities of a certain Senor Pateras-Pescara during a sojourn in the Santé prison—has created a certain amount of interest.

Senor Pateras-Pescara may be remembered by some as the designer of a very curious hydro-aeroplane which in its model form was tested at the Eiffel Laboratory in Paris just before the war.

It is stated that his new inventive activities are being encouraged by the French Air Service authorities.

## THE PRINCE OF WALES' APPEAL FOR THE BOY SCOUTS FUND.

H.R.H. the Prince of Wales has addressed to the Institution of Aeronautical Engineers a copy of the appeal which he has issued on behalf of the Boy Scouts Fund. The secretary of the Institution desires that the Institution may make as adequate an answer as possible to the appeal.

Donations to the fund may be addressed personally to H.R.H. the Prince of Wales, K.G., Chief Scout for Wales, St. James' Palace, S.W.1. Cheques should in this case be drawn to the order of H.R.H. the Prince of Wales, and crossed "Boy Scouts Fund."

Or members may forward subscriptions to the Secretary, the Institution of Aeronautical Engineers, 60, Chancery Lane, W.C.2, to be forwarded, together with a list of the subscribers, as a collection made by the Institution.

## UNEXPLAINED ACCIDENTS.

The following letter has been received :—

Sir,—*Re* Mr. E. Weiser's letter, it is only fair to Messrs. A. V. Roe and Co., Ltd. (who, as stated in my letter, converted the Avro in question), to say that they always cover in the gap mentioned by Mr. Weiser; in fact, they go further than he suggests, and cover the rudder controls as well.

The whole floor space is thus covered with stout three-play and aluminium sheeting from the front edge of the rear seat to the pilot's seat. The lady who locked the controls twisted her legs down behind the rear edge of the footboards in a most unnatural and uncomfortable position. Against such foolishness as this it is impossible to guard except by verbal (or written) warning.

No manufacturer expects his machine to be used as a gymnasium. (Signed) DAVID F. ANDERSON.

## THE SPECIAL ISSUE OF "L'AIR."

The special propaganda issue of *L'Air,* which is in fact a very excellent catalogue of the French Aircraft Industry, is now in being. It is hoped that copies will arrive in this country very shortly.

Any aircraft firm, or any firm concerned directly with the production of aircraft or aircraft material, can obtain a copy of *L'Air* free by applying on their usual business paper to Monsieur G. Roche d'Estrez, *L'Air,* 5, Rue l'Isly, Paris.

Those who are not actually in the Aircraft Industry can be supplied with copies at 2s. 6d. each, post free, by The Aeroplane and General Publishing Co., Ltd.

## TRADE NOTES.

### Where Work is Well Done.

Mr. W. H. Barnes, of the Cecil Car Repairing Company, Colindale Avenue, Hendon, N.W.9, who will be remembered as the chief engineer for Mr. George W. Beatty during the war, has recently been appointed by the A.A. and M.U. to be their agent in the Hendon district This appointment is sufficient guarantee of his ability to do satisfactory repair work to cars, and readers of this paper who live in the N.W. district can take the word of one who has had personal experience of Mr. Barnes' work that any jobs entrusted to him will be thoroughly well done

### Bleriot Change of Address.

Blériot, Ltd., motor lamp manufacturers, announce that, to be able to give the best and most prompt attention to all their customers, they are concentrating all their departments, offices, sales, stocks, repairs and works at their factory at 2 and 4, Catesby Street, Walworth, S.E.17 (Tel. Hop 3279), and are disposing of the showrooms they have so long occupied in Long Acre.

All communications, etc., for them should henceforth be sent to the factory as above.

## COMPANY NOTICES.

### Mortgages, Charges and Satisfactions.

LANG PROPELLER, LTD.—Satisfaction in full on Dec. 9th, 1920 (a) of charged Deposits of deeds registered July 8th and Dec. 2nd, 1915, securing advances up to £12,000 and (b) of debentures dated Oct. 15th and 21st, and Nov. 3rd, 12th, and 17th, 1920, securing £5,000.

GWYNNES ENGINEERING CO., LTD.—Land Registry Charge on certain freehold and leasehold properties in Hammersmith and Chiswick, dated Dec. 29th, 1920, to secure £300,000. Holders :—The Right Hon. the Lord Morris, P.C., K.C.M.G., K.G., and Lieut.-Col. the Hon. C. H. C. Guest.

AERO STATIONS, LTD.—First mortgage debentures, dated Jan. 12th, 1921, to secure £2,000 charged on company's undertaking and property, present and future. Holder :—L. J. Lynwood, 34, Lombard Street, E.C.

DH
D.H. 16
D.H. 18
D.H. 1.
D.H. 2.
D.H. 14
D.H. 3.
D.H. 11.
D.H. 4.
D.H. 10A.
D.H. 4A.
D.H. 9R.
D.H. 9A.
D.H. 9.
D.H. 6.
D.H. 5.

## FACTS ABOUT DE HAVILLAND AEROPLANES

**During the period of August, 1914, to November, 1918, the number of DE HAVILLAND machines built in Great Britain and the United States o America amounted approximately to 30 per cent. of the total output of Aeroplanes of those two Allies.**

**Every DE HAVILLAND aeroplane embodies the accumulated experience of 12 years of continuous research and experimenting.**

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### FIRTH'S 5% NICKEL CASE-HARDENING STEEL.

Equivalent to Air Ministry Specification S.17. Engineering Standard Specification No. 75. "5% Nickel Case-hardening Steel."

THIS STEEL IS SPECIALLY RECOMMENDED FOR HIGHLY STRESSED PARTS WHICH ARE SUBJECTED TO ABRASION, SUCH AS GEAR WHEELS, CAMSHAFTS, ETC.

ITS ESPECIALLY TOUGH CORE ENABLES IT TO STAND UP TO HIGH PRESSURES WITHOUT FLAKING OF THE CASE.

**THOS. FIRTH & SONS, LTD., SHEFFIELD.**

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# AEROPLANES

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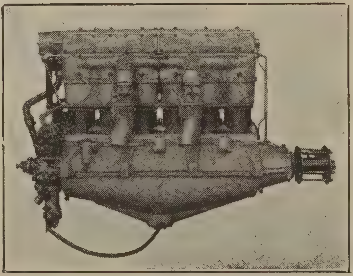
# AERO ENGINES

## OF ALL TYPES FOR ALL PURPOSES.



**Siddeley "Puma" 230 h.p. £425**

The attention of the Aircraft Industry is directed to the large stocks of various makes of engines complete with all spares, accessories and instruments, and in perfect running order, available for immediate delivery at a figure far below to-day's cost price.

**Handley Page, Limited,**

Managing Agents for the Aircraft Disposal Co., Ltd.,
Regent House - Kingsway
London

Purchasers of all the Surplus British Government Aircraft & Accessories

(*Continued from page* 104.)

at once the chances are that several of them would score hits and that all or nearly all would get away, for the vital part of an aeroplane is, after all, a very small part of its total volume.

The effect of an attack by thirty aeroplanes on half-a-dozen ships would be still more confusing to the gunners on the ships, for it would be almost impossible even to an observer much more skilled than a Naval gunner to tell which aeroplane was going for which ship and what its line, speed and distance might be. Therefore the bigger the attack, probably the bigger would be the percentage of hits by the aeroplanes' torpedoes.

At any rate, though nothing has ever been said about it officially (it is hardly likely that the Admiralty would give itself away) there is good reason to believe that in the Portland affair the eight torpedoes hit six different ships, all of which would have been put out of action. The Navy claims, one believes, that one ship was hit by a torpedo which glanced off another, and that so only five ships were put out. Still that is quite good enough for eight machines, seeing that in real war there would have been at least thirty machines attacking the six ships that were hit.

### The Matter of Stowage.

Another objection raised by the gentleman, late R.N.A.S., is that it would take a very big ship to carry a hundred aeroplanes. Perhaps it would, but then it would take a very big ship to carry enough gun-power to sink twenty battleships, which is what a hundred aeroplanes could do with almost absolute certainty. And, as a matter of fact, when the design of capital ships armed with aeroplanes is tackled seriously and when aeroplanes for these ships are designed properly for the job it will be found that considerably more than thirty can be stored conveniently and handled expeditiously on a ship the size of the *Eagle*.

Moreover, by that time, be it remembered, aeroplanes to lift a given weight of torpedo will be only about half the size of the aeroplanes of to-day, thanks to new and improved wings and engines. So that disposes of another objection which may seem sufficient to a Naval man whose ideas of seaplanes at work have been gathered from watching commandeered cross-Channel packet-boats or aged tramp steamers laboriously derricking cumbrous float seaplanes inboard or outboard.

### The Logical Conclusion.

Since that little affair at Portland one believes that there has been another demonstration of what aeroplanes can do against warships, and that in consequence the Navy in general and the Admiralty in particular is still more respectfully inclined towards aeroplanes at sea. Of course there are times when aeroplanes cannot fly off decks, just as there are times when the sea is too high or the fog is too thick for guns to be used, and when even submarines (which are many years older than aeroplanes) cannot operate. But, given that the capital ship armed with aeroplanes is as fast and as seaworthy as the capital ship armed with guns, then the aeroplane ship must inevitably sink the gun ship.

The worst of it all is that when the Navy does finally become convinced that the capital ship of the future must be an aeroplane ship, then the Royal Air Force as at present constituted will automatically cease to exist. For obviously the Navy could never tolerate a capital ship which depended for its fighting power on the personnel and matériel of a Third Service.

That time is still some years ahead. The R.A.F. is still at war in many parts of the World. The Army needs its help, and all its available means are being spent on helping the Army. The Navy is at peace, as most of it was during most of the war, and so the R.A.F. cannot afford to attend to the Navy's peace-time wants. Which is a pity, because if proper attention could be given to the development of seagoing aircraft we should very soon have some idea of the ultimate type of capital ship.

As it is we go on wasting money in driblets of a few thousand pounds at a time on silly aeroplanes with wheels and flotation bags—which are the most absurd things that ever happened as Naval aeroplanes. And we go on buying ordinary seaplanes and flying-boats, which are only one degree better. Instead of which we ought to be developing the real amphibian aeroplane which can be catapulted off its aircraft ship complete with torpedo no matter what the roll of the ship, and can get off the sea again if compelled to come down in it.

### What the Navy Wants.

The Navy of to-day wants aeroplanes. It believes in the future of aeroplanes. It knows that the aeroplane of to-day is not an all-weather craft. Its attitude to those who make over-optimistic claims for aeroplanes is best expressed in the American "You gotta show me." When the aeroplane can show that the aircraft ship can sink the gun ship and can be safe against the gun ship in any weather, then the Navy will adopt the aircraft ship as the capital ship.

The Navy cannot do so till the right aeroplanes are produced. And the right aeroplanes cannot be produced so long as the R.A.F. is starved for money—and so long as some of its present people are allowed to hold their jobs. Meantime the Navy must lay down capital ships. And the only capital ship that can be laid down to-day to be commissioned three years hence is the successor to the *Hood*. The successor to the *Eagle* is too far away to be within the region of practical politics. So that's that.—C. G. G.

## CONCERNING SOME CLAIMS BY INVENTORS.

### The Tail Gun-Pit Scheme

According to the *Daily Telegraph* of Jan. 28th, a meeting of the creditors of Mr. C. J. H. Mackenzie Kennedy was held on the previous day or thereabouts. Mr. Kennedy will be remembered as the moving spirit of the Air Post of Banks, Ltd., and previously to that as the builder of the four-engined biplane more or less on Sikorski lines which did not fly at Northolt. The statement of affairs showed liabilities amounting to £42,324 and assets valued at £184,782.

It was stated that he had already received £31,000 from the Treasury as an award for designing the pseudo-Sikorski. It is also stated that the assets include a claim against the Air Ministry for £171,000 in respect of "an important invention which had been used."

Why the £31,000 was awarded for such a very obvious machine as the pseudo-Sikorski is difficult to understand, seeing that no machine of this type or of anything like this type ever did anything in the war, and that no award of any kind was given to the real pioneers of multiple-engined machines such as the Short Brothers, Squadron-Commander Dyott, the Aircraft Manufacturing Company and the Fairey Aviation Company, all of whom produced multiple-engined machines which demonstrated the value of such machines before the type was ever used on active service. It may be assumed that the profits made by Handley Page, Ltd., out of their multiple-engined machines were such as to leave no reason for putting in a claim for the invention of such machines, but if any money had to be awarded for actual work done by multiple-engined machines, then that money undoubtedly belongs to Handley Page, Ltd.

As regards the £171,000, it is gathered that this is a claim for the invention of the idea of seating a gunner in a cockpit in the tail of a multiple-engined machine for the protection of that tail against hostile aircraft. In itself the idea is, of course, perfectly obvious, but then so are many other epoch-making inventions when once they have been produced. But the point is that this particular "invention" was never used by a British aeroplane on active service. It is true that it was used by the Germans and it is of course possible that the Germans may have got the idea through their excellent Intelligence Service from Mr. Kennedy's or some other machine. But one questions whether large sums of money should be paid for inventions made in this country and used by the Germans.

The only machines with gun-pits in the tail which ever flew in this country were the four-engined Handley Pages, and none of these was ever used actually in the war. Also it is very improbable that the Handley Page gun-pit was derived from Mr. Kennedy's idea.

In any case it will be a public scandal if such an amount, or anything like it, is paid for an invention which does not constitute an invention in the ordinarily accepted sense of the term in that it does not introduce new mechanical ideas and, moreover, an invention which was not used and was not of any use in the war.

It is alleged that there is another claimant in the field for an award for the same idea, and that this claim is bigger than Mr. Kennedy's. It is fairly obvious that some, or indeed many, of the claims which go before the Inventions Committee are "settled out of court," so to speak, and only go before the Committee as a matter of form. Therefore it seems probable that the Authorities may favour Mr. Kennedy's claim and settle it before going before the Committee in order to forestall the still bigger claim which it might otherwise have to pay another claimant.

Of course when one considers the amount of money that the Government has paid out—not necessarily for inventions, but for "hardship" allowances, cancelled contracts, and such things—to bogus claimants, grafters and others it may be a little difficult to object to the payment of a large sum to a perfectly bona fide claimant like Mr. Kennedy, who at any rate has and has had ideas for the benefit of aviation, even if nothing of material value to aviation may have materialised from those ideas so far. But if a sum is paid for this invention it will be none the less a public scandal though one may be quite prepared to wish good luck to Mr. Kennedy in his attempt to get it.

### A Deserving Case.

It is stated that a claim has been entered by William Beardmore and Sons, Ltd., for an award on account of the B.H.P. engine. This engine originated from the old 160-h.p. Beardmore. Major F. B. Halford suggested alterations and additions which were made a working proposition by Mr. T. C. Pullinger and financed by Sir William Beardmore (now Lord Invernairn). Later this engine (which derives its name from the initials of Beardmore-Halford-Pullinger, conveniently standing also for brake-horse-power) was handed over to the Siddeley Motor Company, who made further improvements in detail, so that by the end of the war the "Puma," as the Siddeley version was called, was recognised as one of the most reliable engines in the world. With it the Independent Force, R.A.F., did much good bombing in Germany towards the end of the war.

The Beardmore Company certainly deserve an award at least as great as that very justly given to Gwynnes, Ltd., for developing the B.R. engine. In fact the "Puma" and the original B.H.P. together did far more work in the war than the B.R. ever had time to do, and there were many more of them "on charge" than there were of the B.Rs. On the whole, for sheer work done the B.H.P. and the "Puma" deserve still bigger awards.

Therefore one is strongly of the opinion that both the Beardmore Company and the Siddeley Company are entitled to very large sums, comparable to the sum of those awarded for such important improvements (which were not inventions) as the Buckingham bullet, the hydro-vane, and the "tanks" all put together.

### Another Strange Claim.

It is said that among the numerous claims which are being put forward either under the heading of royalties on patents or as awards to inventors is one by the Chauvière airscrew firm, which is apparently endeavouring to extract from the British taxpayer a sum of money on the very doubtful grounds that this firm originated the four-bladed laminated airscrew. It certainly seems that it is not necessary to make any payment on this claim, which appears to be as preposterous as many others which have been made.

The Chauvière patent, one believes, was simply for an airscrew in which the line of the leading edge of each blade when continued passed through the centre of the airscrew boss. Thus any two opposite leading edges formed a diameter of the circle of the airscrew.

So far as the claim to a laminated four-bladed screw is concerned, those interested in this claim should refer to the early airscrews used by Mr. A. V. Roe, for no four-bladed wooden airscrew of his type could very well be built in any other way but on the laminated principle. Mr. Roe's early airscrews were made with a metal boss. Some had metal blades, but others were cut out of soft wood and veneered with hard wood across the grain to give the necessary strength. This was in principle the same as a lamination.

## CIVIL AVIATION SUBSIDIES IN FRANCE.

The French Government has adopted new regulations in regard to the granting of subsidies to aerial transport companies. In the past all machines actually engaged on aerial transport services received subsidies for every flight whether any load was carried or not. Under the new system the amount of subsidy for each machine will depend on the load carried. There is a vast difference in principle between the two methods. It will no longer be comparatively easy to maintain an aerial service unless efforts are also made to make that service useful.

## THE LOSS OF H.M.A. R.34.

On Thursday noon, Jan. 27th, H.M.A. R.34 left Howden on an instructional cruise under the command of Capt. Drew, and in a dense fog struck a hillside on the Yorkshire Wolds at a height of about 800 ft. at 00.12 on the 28th. Three of her engines were damaged and she lost the forward and aft airscrews, but she managed to maintain a speed of 8 or 10 m.p.h. At dawn she was about 12 miles out to sea off the mouth of the Humber and eventually arrived at Howden at 16.30, where she was taken in charge by a landing party of 300 to 400 men.

It was then found that, owing to the increasing wind, it would be impossible to get her into the shed. Rising and falling slowly, she bumped many times and sustained damage to the front portion. She was then moored out on the three-wire system, but late in the evening the wind caused her to dip until she bumped so violently that the front car was pushed into the envelope. With the severance of some of the front rings she collapsed, the nose crumpling up and breaking off.

In a bare official statement issued on Saturday the Air Ministry said that a large party of men had been engaged in salving what can be saved of her.

This flight was her first trip for nine months, after having been overhauled and fitted with mooring-mast tackle for the forthcoming commercial airship demonstrations. In most of the papers published over the week-end General Maitland, who is in charge of Howden, was reported to have said that, had Howden been equipped with the proper moorings, the R.34 would have ridden the gale.

One, the *Sunday Pictorial*, in its efforts to be original, edited General Maitland's statement to read: "That if the crew had been provided with mooring masts the ship would have ridden out the gale." It really requires a Tom Webster or an H. M. Bateman to illustrate how this provision would have prevented the accident. Why it is necessary for a paper, whose more expert knowledge concerns deaths by violence, net circulation figures and other abstruse problems, to alter statements of a technical nature is past comprehension, and only emphasises the utter futility of the lay Press when it condescends to devote a small part of its valued space to the reporting of an aviation accident.

## AERIAL CONTRAVENTIONS OF THE PEACE TREATY.

The following is the text of that portion of the official resumé of the Allied Governments' Conference held in Paris from Jan. 14th to 29th, directly concerning aircraft disarmament and Germany's infringement of the Treaty of Versailles drawn up and signed by Great Britain, France, Italy, Belgium and Japan on Jan. 29th, 1921:—

I.—Germany has not surrendered all the aeroplanes, hydro-aeroplanes, motors, balloons, hangars (to be dismantled, destroyed, dispatched, or delivered (out of the country)), balloon accessories, wireless telegraph and photograph equipment, hydrogen factories and reservoirs, machine-guns, and other aeronautical material (Article 202). It may be noted with regard to the most important of this material there remain to be surrendered in accordance with certain estimates 1,400 aeroplanes and 5,000 engines.

II.—Since July 10th, 1920, Germany has recommenced aeronautical manufacture in spite of the decision taken by the Allied Governments at Boulogne on June 22nd, and she has attempted to export the material so manufactured in spite of the formal orders of the Commission of Control (Article 201).

III.—Germany has refused to furnish the compensation demanded by the Allies for the seven (7) Zeppelins destroyed in 1919 (Article 202).

IV.—Germany has not yet paid the sum of 25,000,000 marks still due as compensation for material improperly exported (Article 202).

V.—Germany claims to have the right to utilise aircraft in her police formations (Article 198).

### Decisions of Allied Governments.

I.—The search for hidden material will be facilitated by the German Government, and the surrender provided for by Article 202 shall be finished before May 15th, 1921.

II.—Germany shall assure the execution of the decision of Boulogne, i.e., no manufacture or import of aeronautical material shall take place until three months after the date on which the I.A.A.C.C. shall declare that Article 202 has been completely complied with.

III.—Germany must furnish the compensation demanded for the destruction of Zeppelins; the detail of such compensation will be fixed by a special contract.

IV.—Germany must pay the sum of 25,000,000 marks referred to above before March 31st, 1921.

V.—Germany shall conform to decision C.A.91-III of the Conference of Ambassadors dated Nov. 8th, 1920, regarding the prohibition of the use of aircraft in police formations.

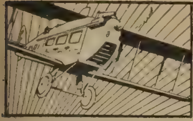
### A Final Warning.

In addition, with a view to ensuring the application of Article 198 of the Treaty, forbidding Germany to possess any military or naval aviation, Germany shall accept the definitions established by the Allied Powers which shall distinguish civil aviation from military aviation forbidden by Article 198. The Allied Governments shall assure themselves by constant supervision that Germany is fulfilling this obligation.

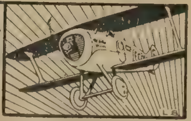
The Allies have repeatedly made allowances for the difficulties experienced by the German Government in carrying out its Treaty obligations. They are now giving a further extension of time, but they sincerely trust the German Government will not render it necessary for the Allies, confirming their previous decision, to consider the grave situation which will arise if Germany further persists in her default.

## A NEW NAPIER.

One learns that the firm of D. Napier and Co. have successfully tested a new aero engine of 1,000 h.p., called "The Cub." It it of 16 cylinders, four blocks set in an X shape, the "V" at the top being narrow and that at the bottom wide. It is designed by Mr. J. Rowledge, the designer of the "Lion." On test "The Cub" gave 1,057 h.p., and it weighs just under one ton. It has been built to the order of the Air Ministry, who have ordered six engines of this type. It is reported that two engines of "The Cub" type are to be fitted to the Fairey "Titania."—G. D.



# COMMERCIAL AERONAUTICS AND CIVIL AERIAL TRANSPORT.



## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### OFFICIAL NOTICES.

AIR MINISTRY NOTICES TO AIRMEN.

No. 1, Jan. 1st, 1921.—Aerodromes for Civil use: Consolidated List. Gives complete list of Aerodromes available for Civil aircraft.

No. 2, Jan. 12th, 1921.—Donibristle Aerodrome—Ground Levelling. Describes position of these operations.

No. 3, Jan. 12th, 1921.—Switzerland: Dubendorf Aerodrome. Gives full particulars of Aerodrome, with plan.

No. 4, Jan. 17th, 1921.—Donibristle Aerodrome Obstructions. Warns pilots of row of poles carrying electric light cables.

No. 5, Jan. 18th, 1921.—Aerodromes for Civil use. Amendments.

No. 6, Jan. 19th, 1921.—France—use of Military Aerodromes. These stations are now only for emergencies.

No. 7, Jan. 19th, 1921.—Government Aerodromes. Prices of Aviation Spirit. List of amended prices.

No. 8, Jan. 19th, 1921.—R.A.F. Aerodromes. Standardisation of obstruction lights.

No. 9, Jan. 21st, 1921.—France—Aerodromes and Meteorological Stations. Warning about obstructions at St. Inglevert and notes the absolute unsuitability of Maubeuge for anything other than airships, even in emergency. Notes on new meteorological stations.

No. 10, Jan. 22nd, 1921.—Manchester (Didsbury) Aerodrome. Reduction of landing area.

No. 11, Jan. 22nd, 1921.—Penshurst Landing Ground Telephone. Telephone removed from Aerodrome. Cancels No. 9 of 1920.

No. 12, Jan. 24th, 1921.—Felixstowe Seaplane Station Obstruction. Temporary boom moored in Harwich Harbour

No. 13, Jan. 28th, 1921.—Pilots' Licences. Compulsory examination in Navigation. Also gives syllabus of examination for application for pilot's licence, consisting of 136 questions

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G.E.A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

JANUARY 24th:

S.N.E.T.A., DH4, O-BADO, London-Brussels, 13.20-15.10, G.&M., 2, Van Opstal.

M.A., Breguet, F-CMAC, Paris-London, 12.40-15.59, G.&M., Nil, Martel

M.A., Spad, F-CMAV, Paris-London, 12.45-15.25, Nil, 2, Le Sec.

JANUARY 25th:

M.A., Breguet, F-CMAC, London-Paris, 12.25-15.00, Nil, Nil, Martel.

M.A., Spad, F-CMAV, London-Paris, 13.40-16.00, G.&M., Nil, Le Sec.

M.A., Breguet, F-CMAF, Paris-London, 12.40-15.55, G.&M., 1, Challoux.

JANUARY 26th:

NIL.

JANUARY 27th:

G.E.A., "Goliath," F-GEAC, Paris-London, 12.15/27th-10.45, G., Nil, Labouchere & 1.

M.A., Spad, F-CMAW, Paris-London, 13.05-16.00, G.&M., Nil, Le Sec.

JANUARY 28th:

G.E.A., "Goliath," F-GEAC, London-Paris, 12.40—, G., Nil, Labouchere & 1.

M.A., Breguet, F-CMAF, London-Paris, 12.57—. Nil, Nil, Challoux.

M.A., Spad, F-CMAW, London-Paris, 13.07-15.30, G.&M., Nil, Le Sec.

JANUARY 29th:

NIL.

JANUARY 30th:

M.A., Breguet, F-CMAC, Paris-London, 09.50-12.31, G., Nil, Le Men.

M.A., Salmson, F-CMAN, Paris-London, 10.15-13.15, G., Nil, Charpentier.

### The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

JANUARY 24th:

NIL

JANUARY 25th:

NIL

JANUARY 26th:

H.P.T., DH9, G-EAUI, London-Paris, 11.45-14.00, G.&M., Nil, Fowler.

JANUARY 27th:

NIL.

JANUARY 28th:

H.P.T., DH9, G-EAUI, Paris-London, 13.17 (landed Grandvilliers), G.&M. Nil, Fowler.

JANUARY 29th:

NIL.

JANUARY 30th:

H.P.T., DH9, G-EAUI, Grandvilliers-London, arr. 14.10.

### Air Port Statistics.

CONTINENTAL

| | | | |
|---|---|---|---|
| MACHINES: | | | |
| | Croydon 13 | Cricklewood 2 | Total 15 |
| PERSONNEL.—Passengers: | | | |
| | Croydon 5 | Cricklewood Nil | Total 5 |
| Crews: | | | |
| | Croydon 15 | Cricklewood 2 | Total 17 |
| | | Total Personnel | 22 |

### Inland Flying at Croydon.

Jan. 24th.—M.W.T.C., 1 D.H.6, 2 tests (Lovell).

Jan. 25th-28th.—Nil.

Jan. 29th.—L.A.S., D.H.6 from Leatherhead and joy-riding (Muir); I.A.L. "Vimy" joy-riding (Barnard).

Jan. 30th.—I.A.L. "Vimy" joy-riding (Barnard); L.A.S. Avro from Leatherhead and joy-riding (Muir); D.H.6 joy-riding (Muir); D.H.6 and Avro to Leatherhead (Muir and Pilot of D.H.6, name not known).

### The London Terminal Aerodrome.

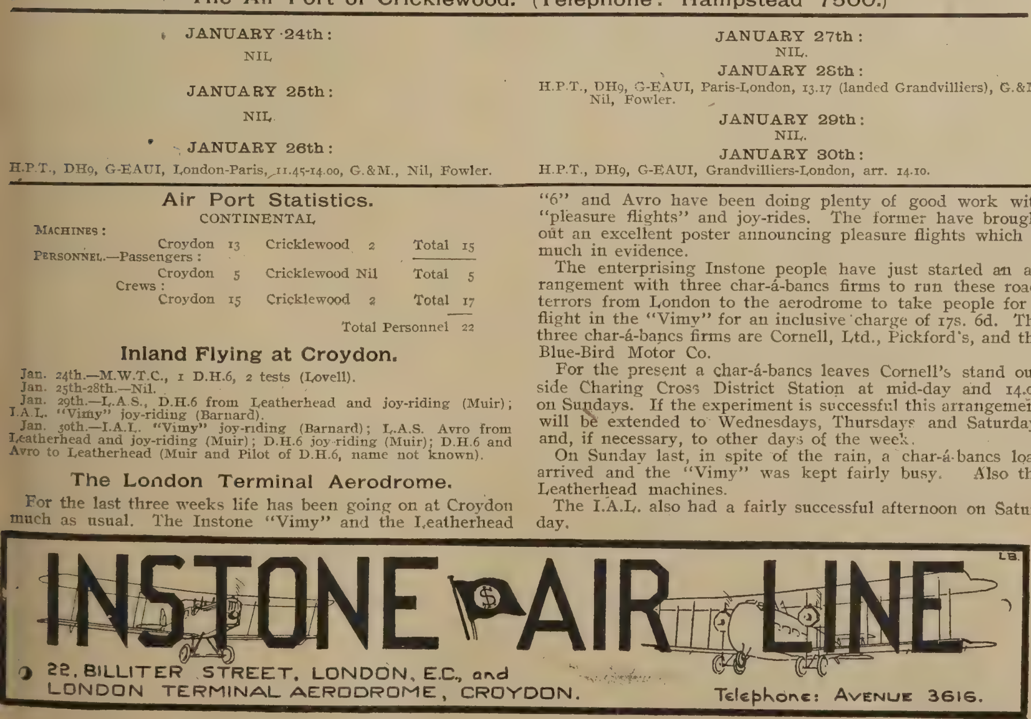
For the last three weeks life has been going on at Croydon much as usual. The Instone "Vimy" and the Leatherhead "6" and Avro have been doing plenty of good work with "pleasure flights" and joy-rides. The former have brought out an excellent poster announcing pleasure flights which is much in evidence.

The enterprising Instone people have just started an arrangement with three char-á-bancs firms to run these road-terrors from London to the aerodrome to take people for a flight in the "Vimy" for an inclusive charge of 17s. 6d. The three char-á-bancs firms are Cornell, Ltd., Pickford's, and the Blue-Bird Motor Co.

For the present a char-á-bancs leaves Cornell's stand outside Charing Cross District Station at mid-day and 14.00 on Sundays. If the experiment is successful this arrangement will be extended to Wednesdays, Thursdays and Saturdays and, if necessary, to other days of the week.

On Sunday last, in spite of the rain, a char-á-bancs load arrived and the "Vimy" was kept fairly busy. Also the Leatherhead machines.

The I.A.L. also had a fairly successful afternoon on Saturday.



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The Dutch K.L.M., who ran the wooden-winged Fokker last year, are starting off with a big programme on April 1st. Several more English pilots have joined them, including Messrs. Cyril Holmes and Milnes, both late of the late A.T. and T. It seems that this firm may register an English branch and run British machines with British engines piloted by Britishers, and so touch the British subsidy. All of which will stop some people from laughing in church.—C. D.

### The Dutch Continental Services.

De Koninklijke Luchtvaart-Maatschappij voor Nederland en Kolonien, or what may be better known as K.L.M., a Dutch air traffic company, have formulated an ambitious programme for their air services during the coming year. It is proposed to inaugurate regular services between Amsterdam and Rotterdam to Brussels, Paris, and London; from Amsterdam to Bremen and Hamburg, and also between Hamburg and Copenhagen, and Copenhagen and Malmo.

The service, which, it is reported, will start on April 1st, will cater for both passenger and goods traffic, and passengers will be able to take with them personal luggage up to 30 lb. in weight to any destination. The K.L.M. is also prepared to cater for parties, to let out aeroplanes for private hire, and to accept contracts for regular journeys.

The following table shows the fares to be charged for passenger journeys :—

Amsterdam or Rotterdam to—

Brussels—Single 50 fls. (£4 3s. 4d.); Return 75 fls. (£6 4s.).
Paris—Single 125 fls. (£10 8s. 4d.); Return 200 fls (16 13s. 4d.)
London—Single 125 fls.; Return 200 fls.

With regard to the charge for luggage, all freight above 30 lb. in weight will be charged from Amsterdam or Rotterdam to Brussels 1s. for every 2 lb., to Paris, London, Bremen, Hamburg, 1s. per lb., and to Copenhagen 1s. 4d. per lb.

The rate for goods sent on freight flights works out at about 1s. 2d. per lb. to Brussels, 1s. 8d. to Paris, and 1s. 7d. to London, with reductions for quantities. Packages received at the company's offices in the morning will be delivered the same day, and those received at noon the next morning.

### The Aerodromes of Britain.

In Air Ministry Notice to Airmen No. 1 of the year 1921, issued on Jan. 21st, 1921, a complete list of aerodromes available for civil aircraft is given. This includes :—

List A :—Government-owned Aerodromes available for civil flying, and at which accommodation exists.

- (a) Civil Aerodromes :—Croydon (London Terminal Aerodrome) and Lympne.
- (b) Service Stations :—Coal Aston (Sheffield), Northolt and Felixstowe, the latter being for seaplanes.

List B :—Aerodromes available for civil machines in emergency only :—

- (a) Permanent Service Stations, 34 in number, including those available for aeroplanes, seaplanes, and airships.
- (b) Stations temporarily retained for Service purposes, 8 in number, 6 of which are airship stations.
- (c) Civil stations, 5 in number.

List C :—Licensed Civil Aerodromes :—

- (a) Licensed Civil Aerodromes, 9 in number.
- (b) Civil Aerodromes, licensed as "Suitable for Avro, 504 K, and similar types of aircraft only," 18 in number.

List D :—Unlicensed Private Aerodromes :—Aerodromes available for civil machines only by special permission of the owners, or in emergency, 5 in number.

The only aerodromes at which Customs facilities exist at present are Croydon, Lympne and Cricklewood.

This makes a total of 84 British aerodromes, which compares favourably with the dozen or so before the War.

### An Accident on the London-Brussels Service.

D.H.4 O-BAIN, belonging to the Syndicat National pour l'Etude des Transports Aeriens (S.N.E.T.A.), and employed on their Brussels-London service, crashed near Folkestone. He left Croydon at 13.43 with goods and mail, but with no passengers, piloted by M. P. J. George, and it is presumed that he lost his way in the mist over the hills north of Folkestone, and in making a forced landing, crashed near Hawkinge.

The machine was wrecked and the pilot was taken to the Royal Victoria Hospital, Folkestone, with serious injuries to the skull and a broken arm.

M. P. J. George died in Folkestone Hospital on Friday morning from peritonitis caused by his injuries. He is a great loss to international aviation, for he was a gallant and skilful pilot and was liked and respected by all who met him. To Belgian Aviation The Aeroplane tenders the sympathy of all concerned with Civil Aviation in the loss of the pioneer pilot of Belgian Civil Aerial Transport.—C. G. G.

### Brooklands.

One understands that at the Weybridge works of Vickers Ltd. a number of 504K type "Avros" will be overhauled and fitted up for the Chinese Government. Also an Avro "Baby," in a healthy condition, stands in the shops for some unrevealed purpose.—J. F. S.

### The Oxford Aviation Services.

The Oxford Aviation Services, under Capt. J. M. Drysdale and Mr. Gomez-Cornejo, are expecting to open this year's flying programme on Feb. 18th.

As the result of a very successful season at Newport, Mon., from June-Nov. last year, another visit is contemplated early this year, and in addition four seaside resorts will be visited.

Up to the end of January they were flying at Caversham, near Reading, the total number of passengers carried for 1920 being over 3,000.

Their equipment consists of three Avro three-seaters, with full staff of ground engineers, all being ex-service men with many years' experience. In addition to straightforward passenger carrying, their programme includes stunting, and for the edification of those who "watch from afar," Mr. Gomez-Cornejo does wing-walking and parachute descents, all of which tend to demonstrate the safety of flying.

### Preston.

The Berkshire Aviation Co., who are flying at Preston, have been handicapped by the bad weather, and numbers of people have been kept away on this account from the aerodrome at Walton Bridge. Several passenger flights have been carried out locally, while cross country flights have been made to Chorley, Darwen, and Blackburn.

Ten free flights were given by the *Preston Herald* to its readers, the fortunate winners being very enthusiastic after their flights with either Mr. J. D. V. Holmes or Capt. Jones.

## NAVAL AND MILITARY.

### The R.A.F. and Airships.

If rumour is to be believed, the Air Ministry have decided to abolish the airship branch of the Royal Air Force. Howden Aerodrome would in that case be closed and all airship material would be handed over to the Civil Aviation Department.

In view of the present shortage of money it is perhaps desirable that this re-organisation should take place. It is imperative that the civil use of airships should be encouraged in every way possible. In any case the airship in nearer efficiency for civil transport work than it is for military use.

It is to be hoped that this decision—if indeed it be true—will not mean the loss to the country of the valuable services of Air Commodore Maitland.

### 100 Squadron's Dinner.

100 Squadron held their second annual dinner at the Russell Hotel on Friday last, some thirty officers and other ranks being present, with Wing.-Cdr. M. G. Christie, C.M.G., D.S.O., in the chair. Half-a-dozen of the diners belonged to the Squadron when it first went overseas. It was decided to form a Committee of four to collect addresses of former members of all ranks, so as to arrange a really big reunion next year. Also it was hoped that when the Squadron comes home from foreign service officers and men of the new Squadron will foregather with the original personnel. An excellent suggestion was that when the Squadron comes home an "Old Members' Day" should be arranged in the summer, for a visit to the Squadron's aerodrome. The question of the Territorial Reserve, R.A.F., was discussed, as was the formation of a Squadron Benefit Society. All former members of 100 who were not at the dinner are invited to communicate with Wing-Commander Christie, c/o The Air Ministry, Kingsway, W.C.2.

### Martlesham Heath Reunion Dinner.

The Reunion Dinner for officers of the Aeroplane Experimental Establishment, Martlesham Heath, will be held at the Café Royal, on Friday, Feb. 25th, 1921, at 7 p.m.

Air Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., R.A.F., will be in the chair.

Tickets, price £1, can be obtained from Capt. P. G. Robinson, Room A 139, Air Ministry, Kingsway, London, W.C.

### A W.R.A.F. Dance.

A dance will be held by the Old Comrades' Association, W.R.A.F., on Feb. 19th, at 7 p.m., at the Westminster Dragoons' Hall, Westminster. Tickets, 2s. 6d., may be obtained from Mrs. Holliss, 41, Gloucester Road, Pimlico; or Miss Scott Holmes, care of The Aeroplane, 175, Piccadilly, W.

The dance is for all ranks of the W.R.A.F. and friends.

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Auster, Ltd. ... ... ... ... ... *Front Cover*
Automatic Telegraph Co.... ... ... ... 123
Beardmore Aero Engines, Ltd., The *Front Cover*
Bowden Brake Co., Ltd., The ... ... ... 124
Bray, Gibb & Co., Ltd. ... ... ... ... 123
Bristol Aeroplane Co., Ltd. ... ... *Back Cover*
Cunard Line ... ... ... ... .. ... 124
De Havilland Aircraft Co., Ltd., The... ... 117
Fairey Aviation Co., Ltd., The ... ... ... 105
Firth, Thos., & Sons, Ltd. ... .. ... 117
Hancock, James Lyne, Ltd. .. ... ... 124
Handley Page, Ltd. ... ... ... ... 118
Heinemann, W. ... ... ... ... ... 122
Imray, Laurie, Norie & Wilson, Ltd.... ... 124
Instone Air Line ... ... ... ... ... 120
Martinsyde, Ltd. ... ... ... ... ... 118
Metal Airscrew Co., Ltd.... ... .. *Front Cover*
Naylor Brothers, Ltd ... ... .. ... 123
New Pegamoid, Ltd. ... ... 124
Nieuport and General Aircraft Co., Ltd. ... *Inside Front Cover*
Palmer Tyre, Ltd. ... ... ... ... ... 109
Roe, A. V., & Co., Ltd. ... ... ... ... 102
Rolls-Royce, Ltd. ... ... ... ... ... 106
Rubery, Owen & Co. ... ... *Inside Back Cover*
Sagar, J., & Co., Ltd. ... ... ... ... 101
Sankey, J. H., & Son, Ltd. ... ... ... 101
Sunbeam Motor Car Co., Ltd. ... ... ... 113
Supermarine Aviation Works, Ltd. ... ... *Inside Front Cover*
Titanine, Ltd. ... ... ... *Front Cover &* 115
Vickers, Ltd.... ... ... ... ... ... 111

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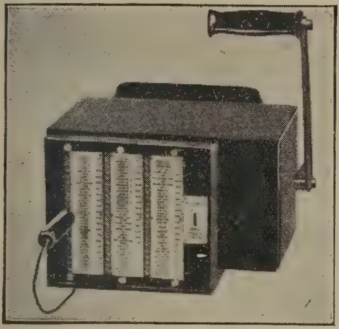

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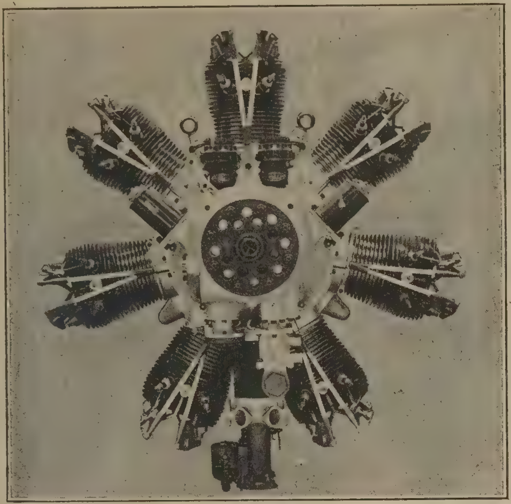

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## ON SUNDRY BOOKS.

Now that the annual spell of cold weather is setting in at the advent of the British Spring, people may be glad to know of a few books which will provide entertainment and instruction during the cold evenings, when sitting by the fire is preferable to the after-dinner strolls to which the balmy airs of January have accustomed us. Here, then, are sundry *obita dicta* on men and books, which may or may not conduce to the begging, borrowing, stealing, hiring, or, at worst, buying of the said publications:—

### AMONG WAR-TIME FRIENDS.

THE HISTORY OF 60 SQUADRON, R.A.F. By Group-Captain A. J. L. Scott, C.B., M.C., A.F.C. With a Preface by the Rt. Hon. the Lord Hugh Cecil. Pp. 145 + xx. (William Heinemann. Price 15s.)

Group-Captain Scott's history of 60 Squadron, R.F.C. and later R.A.F., is so good as to make one wish that it had been a great deal better. Some squadron histories are so badly done that they ought never to have been written. 60 Squadron's is good, but there ought to have been more of it, and it could have done with a little editing.

Evidently Group-Capt. Scott's weak side is the technical side. He is undoubtedly a leader of men, or he would not be where he is now, Private Secretary to Mr. Winston Churchill and a Group-Capt. at that, while so many of his contemporaries are mere flight-lieuts., and such small fowl, but he is not an aeronautical engineer. If he had been he would not talked about "two cockpits or nacelles" in a tractor biplane, also he would not have explained that an S.E.5a runs farther on the ground when landing than does a Nieuport "owing to the extra weight." Personally, one is under the impression that an S.E. runs as she does because when on coming in contact with the ground she has less weight on her tail-skid and also because she actually has more lift in her planes at any given speed when landing than has the Nieuport at the same speed.

Another bad point about the book is that the chronology is chaotic, and one frequently finds oneself after reading a number of pages of quite convincing narrative suddenly jerked back to things which on investigation prove to have happened some months before. Yet another bad point is the author's irritating habit of putting in footnotes which are apparently intended for the education of the editor of a daily newspaper. Certainly most of them would not be informative to any ordinarily educated person. For example, there was no need to describe a trailer in a footnote as "a vehicle used for moving dismantled aeroplanes by road." Nor to describe the Scarpe as "a stream flowing north of Arras." Perhaps he hoped thus to endear himself to reviewers on the daily Press.

Lord Hugh Cecil's amiable preface, if a trifle flowery in phrasing, gives a good picture of the life of the R.F.C. in France, but it is curious how his essentially civilian mind reveals itself in placing the Army and Navy in that order of precedence.

Having got rid of these quarrels with the book it must be said that the rest is a joy to read, and from the second page, on which the formation of 60 by the ever-to-be-lamented "Ferdy" Waldron is mentioned, right to the end of the book in the index, one constantly meets with old friends whose work one watched and admired so keenly during the war. Group-Capt. Scott has the faculty of describing men and their ways a great deal better than many professional authors who pride themselves on their characterisation. The word-picture of Serjeant-Major Aspinall, "the Great Man," one of the Barrington-Kennett guardees, is excellent, but perhaps the best word-portrait in the book is that of the inimitable Smith-Barry.

Whether it is a libel to say of Smith-B. that "he has been seen to walk down the Strand in full uniform with an umbrella" one does not know, but the statement must be quoted because if it is not true it is probable. Smith-B., like Habbakkuk, is *"capable de tout."* Some day somebody ought to write the history of Smith-B. and his régime at Gosport and his five-minute command of the Northern Training Brigade

Probably nothing in such a book would be much funnier than an incident in his return to London only a few weeks ago, and after Group-Capt. Scott's book was in print Seeing a former officer of 60 Squadron in a taxi-cab, he himself being on the top of a 'bus, he leaped from the top of the 'bus onto the taxi, hailed his former subordinate through the window from the roof, and proceeded to climb back on the top of the 'bus again. Whence he descended by the stairs and entered the taxi by the normal method.

Incidentally, one may remark that Group-Capt. Scott himself was very nearly as famous a figure in the late R.F.C. as Smith-B., and nobody ever thought of calling him anything except "Jack" Scott. When a man is known by an abbreviated Christian name he is either amiable and futile or a big man of some sort, and it may safely be said that Jack Scott's handling of 60 during one of its most difficult periods over the lines shows him to have been of the latter kind.

Probably the person to whom the reader will owe very nearly as many thanks as Jack Scott for this book is one W. E. Molesworth, a Flight Commander in the Squadron from March, 1917, onwards, and now, one regrets to hear, returned to his own regiment, the Munster Fusiliers. The Molesworth letters are sprinkled at intervals throughout the book and they provide both comic relief and graphic description. Molesworth writes the slang of the R.F.C. just as one used to hear it talked during the war. To read him is almost like sitting in the opaque atmosphere of a Nissen hut after the patrols had come in and hearing what people had to say about one another.

Squadron 60 was fortunate in its personnel. It lost heavily at times, but it had some wonderfully good people, for instance, Bell-Irving, a member of that astounding family whose name appeared in one way or another in practically every list of promotions or decorations that was published throughout the war; Meintjes, whom the irrepressible Molesworth calls "a coloured troop," and whose name is spelt wrongly all through the book; Ball and Bishop, the two particular star turns of the squadron; Fry, the immobile; Caldwell, a born fighter; Middlemas, better known of course as "Christmas," and later brigade machine-gun officer; Kennedy-Cochran-Patrick, whom one remembers meeting at Marie Capelle in 1917; Gilchrist, who later commanded 56 and kept a "tame Hun" in a tank (does he remember taking his Brigade Commander to see his pet?); Clark, whom one met commanding 60 Squadron at Quiévy about a week before the end of the war; Hamersley (whose name is also spelt wrongly), since the war famous as an Avro pilot; and many another. In fact, reading the book is very much like paying a visit to the R.A.F. Club.

One of the best of the killed was certainly Selous, son of a famous father. Jack Scott devotes some pages, in connection with the death of Selous, to lengthy definitions of gentleman's character as described by Burke, Newman and Cavendish, for which he was indebted to Lord Hugh Cecil. One wonders whether Lord Hugh or the author of the book has ever met the two simplest and shortest definitions of a gentleman: (a) A gentleman is a man who is never rude unintentionally, and (b) A gentleman is a man whom one can introduce to anybody without feeling anxious.

There are many excellent stories in the book. Perhaps the best of them is that of the Hun officer who landed at one of our aerodromes in a French Bréguet and posed as a Frenchman, and afterwards landed at a French aerodrome in a British aeroplane and posed as an Englishman. It is satisfactory to see that Group-Capt. Scott gives the Hun full marks for his gallantry. One wonders whether, in his present official position, the author has ever come across the true story of Mr. Beiheller, whose bravery was of a very similar kind. Another very good story is that of one Ridley, who, having damaged his machine when dropping a spy, spent two months behind the German lines in Flanders and finally returned through Holland.

The photographs in the book are excellent and particularly valuable are two excellent maps, the first of which one does not recall ever having seen before. This one shows the disposition of the Armies on the whole front just before the big Allied attack began on September 25th, 1918; and the other shows the gains of the British troops in the successive attacks between Aug. 8th and the Armistice. Altogether, despite its defects, 60 Squadron and the historian are to be congratulated on their history.

## A WORKMANLIKE RECORD.

THE HISTORY OF 99 SQUADRON, INDEPENDENT FORCE, R.A.F., MARCH, 1918—NOVEMBER, 1918. By Squadron-Leader L. A. Pattinson, D.S.O., M.C., D.F.C. (6 pages + 74 pages. Illustrated. W. Heffer and Sons, Ltd. 15s. net.)

One of the charms of these squadron histories is that no two of them are alike. Each has its own particular points to recommend it, though some are less to be recommended than others. The History of 99 Squadron covers a period of only eight months, but anyone who has read Squadron-Leader Pattinson's record of those eight months will have perhaps a better idea of the work of a bombing squadron than he will get from any other history.

One emphasises the word "work," for this history is very much too serious to deal with the lighter side of the Squadron. It is simply a plain working record of what the Squadron did day by day from March 11th, 1918, when it was formed as a war squadron under Major Pattinson, until November 11th, when hostilities ended and the Squadron ceased to do the work for which it was formed.

Lest it should be thought that this is simply a series of official returns of the Squadron's work let it be clearly understood that although Squadron-Leader Pattinson has done his level best to avoid anything in the way of sentiment or humour, or what is called by journalists "heart interest," the book is none the less full of human interest of the very best kind. One finds on page 3 a list of the Officer personnel of the Squadron as it was when it went overseas, and by the time one is halfway through the book one finds oneself taking a vivid personal interest in the doings and the fate of each of these individuals, who at the beginning of the book merely represent so many names on paper.

The fact that Major Pattinson has made the personnel of his Squadron live in spite of his best efforts to be strictly formal and unemotional is perhaps the best possible testimony to the sincerity with which he has done his work. He has certainly achieved this effect without in the least intending to do so, for his personal references to each individual officer are couched in the quietly dignified or even stilted terms of an official citation in a list of decorations. Probably there has never been a history written with less personal bias or with finer impartiality.

Some very curious facts emerge from this history. One is that the best fighting men and the best navigators in the Squadron appeared also to be those who had the least trouble with their machines and engines. One finds time after time that the same formation leaders and certain pilots get to their objectives and back, though other and different people who follow them do not reach the lines, or return owing to engine trouble or some other trouble shortly after crossing the lines day after day. At first it strikes one as being remarkable that the men with the best brains should happen to have the best machines and the best engines. Then it strikes one that it is not a matter of chance at all, but merely a fact that the man who is the best pilot and the best navigator and the best bomber and the best formation leader is also the man who takes the greatest personal interest in the state of his mechanical adjuncts. In other words, that genius is in fact an infinite capacity for taking pains.

Another fact that impresses one is the hopelessly untrained state in which pilots were rushed out to the Independent Force even in the middle of 1918. Undoubtedly the training system in England at that period was the finest in the world so far as fighting pilots were concerned. The Gosport system of training initiated by Major (later Brig.-Gen.) Smith-Barry turned out the most wonderful pilots, as pilots. The fighting schools produced Hun-killers in quantities, but it is quite evident from this book that even towards the end of the war the training of bombing pilots not only in the art of bombing, but in the science of air navigation, was utterly neglected.

One sees that whenever a new batch of pilots and observers joined the Squadron it was practically necessary to stop the whole of the Squadron's work for a couple of weeks while the new pilots were being trained to handle their engines properly and to maintain formation and to find their way across unknown country. Major Pattinson himself says, in chronicling the arrival of five new pilots, "The latest arrivals were taken up as passengers with the senior pilots of the Squadron on a demonstration of formation flying, as it had been found in the past that new pilots could not be easily impressed with the idea of really close flying."

Another evidence of the untrained state of pilots and observers who were sent out even at this late period is the number who came back shortly after starting on raids suffering from air sickness or giddiness. If the training of bombing pilots had been properly carried out in England the inability of the pilots to stand flying at considerable heights would have been discovered before they were ever sent to France.

One entry particularly deserves quoting: "On July 12th, 13th, and 14th, no operations were detailed owing to shortage of supplies, due to strikes in England." When one reads an entry of this kind it seems a pity that the London Air Defence Area became so efficient so quickly. There were no raids in England worth mentioning after May, 1918, and consequently the British workman regarded the war as being over as far as he was concerned, and began striking again, which he would certainly not have done if the Germans had maintained those effective raids which scared the workman to work in defence of his own precious skin.

As one has said there are very few relieving touches of humour in the book, but one of them particularly deserves recording. Returning from a raid, Lieut. Broadbent and Serjt. Jones landed among the foot-hills of the Vosges not knowing whether they were on the German or the French side of the lines and ran to cover in case the Germans appeared. Then, to quote Major Pattinson, "For a few minutes they waited in trepidation, but were finally reassured by hearing an irritated voice remark, 'Where have those gard-damned aviators gone?'" It does not seem to have struck the aviators that they might have come down in an American sector.

Undoubtedly the Squadron's worst day was July 31st, when twelve machines of "A" and "C" Flights started to bomb Maintz. Three dropped out with genuine trouble, and the remaining nine machines were attacked by forty hostile scouts near Saarburg. Seeing that it was impossible to reach the objective against such odds, Captain Taylor, the leader of the raid, decided to bomb Saarbrucken, thus adopting the doctrine of the Limited Objective according to Clausewitz. Four machines were shot down before this second objective was reached.

On the return journey three out of the remaining five were shot down, and it was only because of the appearance of two formations of 104 Squadron that the remaining two machines got home. In this case again it is of interest to notice that the pilots who managed to save their machines were two of the best in the Squadron, Captain Taylor, the leader of the raid, and Lieut. Notley. Unfortunately two of the Squadron's best pilots were among the killed, and two more of the best were taken prisoner.

The loss of seven machines out of nine which crossed the line would seem to be enough to break the nerve of the Squadron. Major Pattinson records that, "In spite of the great press of work during that period, General Trenchard found time to spend several hours with the Squadron, and General Newall and Lieut.-Colonel Baldwin arrived in the afternoon and stayed to dinner," with the result that "The feeling of despondence which was naturally felt on this day was considerably relieved by the great sympathy and kindness shown towards the remnant of the Squadron by the senior officers of the Independent Force."

After this tragedy one again find the lamentable remark, on August 1st, "The majority of the pilots who had recently joined the Squadron had done practically no formation flying in England."

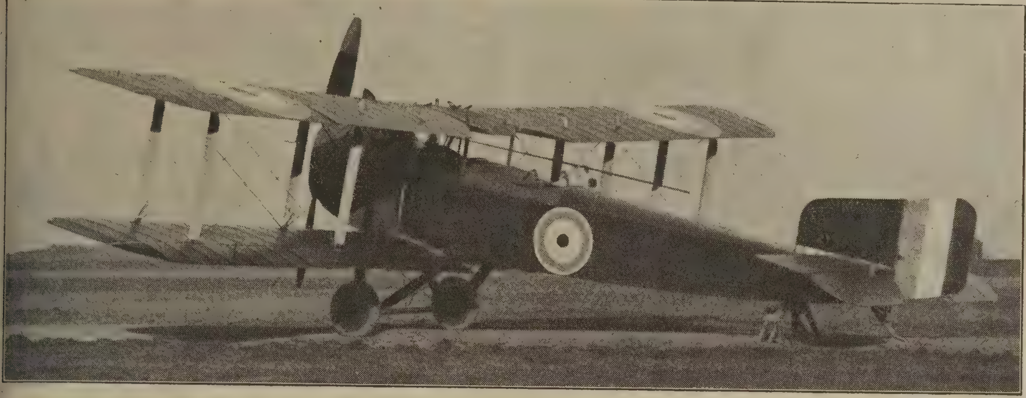
Major Pattinson records as a matter of form a flight on August 20th by himself with Lieut. Walker as passenger when he flew above the clouds and bombed Dillingen, descending within three miles of the objective after 36 minutes' flying by compass over practically unbroken clouds. The attack took the town entirely by surprise, with the result that no fire was opened on the machine till after its bombs had exploded. A few seconds afterwards the machine again entered the clouds. The pilot steering by compass found himself some ten miles west of his aerodrome on descending.

This was the only single machine daylight raid carried out on Germany by a unit of the Independent Force, and it was the only daylight raid successfully accomplished by navigation without sight of landmarks on the route. It is an example of what every bombing pilot should be able to do, either singly or as one of a large formation, in any air force properly trained and adequately equipped with navigating instruments.

Another horrible example of the state of home training is provided in the record of August 22nd, when eleven machines of 99 Squadron started on a raid, seven of them returning before reaching the line, of which one alone was suffering from a genuine defect in its engine. In every other case the supposed engine trouble was merely caused by the fact

(*Continued on page 142.*)

# Another Manifestation.



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She was designed in 1916; She was delivered to the R.N.A.S. in April, 1917; She was on Service till after the Armistice; She was bought back in May, 1919, as a "Disposal" Machine; She was used to carry newspapers from Blackfriars to Thanet early in 1919; She was used for Experimental Work during the Summer of 1919; She was flown in the Schneider Cup Race in September, 1919, and was the only competitor to return intact and under her own power; She was used with experimental Amphibian Undercarriages during the early part of 1920; She did Ferry Work between Southampton and Sheerness as a Seaplane in the Summer of 1920; She has survived Nine Different Engines. In September, 1920, She competed in the Air Ministry Competition for Amphibian Aeroplanes.

In all this work no single Component Part, except the Undercarriage, has been replaced. Fuselage, Wings, Tail-Plane, Rudder, Elevators, Fin, Tail-Float, even the Engine-Bearers, are those originally fitted. The Wings have only been re-covered once, the Tail-Uuit still has the original fabric. The Cock-Pit has been altered to carry one, two, and three people.

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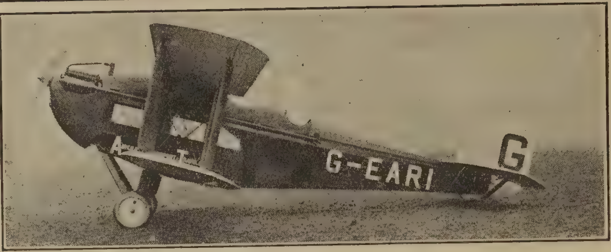

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## SPECIFICATION AND PERFORMANCE.

**Engine—**
450 H.P. Napier "Lion."

**Main Dimensions—**

| | |
|---|---|
| Span | 50 ft. 6 ins. |
| Chord | 6 ft. 6 ins. |
| Overall Length | 38 ft. 10 ins. |
| Overall Height | 13 ft. 0 ins. |

**Capacity—**
8 passengers or 2,200 lbs. of freight in 255.75 cub. ft.
1 Pilot (NOTE—Cubic capacity for heavy loads only — 200 cub. ft.)
105 Gallons Petrol,
10 Gallons Oil.

| **Weights—** | With 8 Passengers. | With Freight |
|---|---|---|
| Machine empty with water | 4,040 lbs. | 3.880 lbs. |
| Crew | 180 lbs. | 180 lbs. |
| Useful Load | 1,440 lbs. | 2,200 lbs. |
| Petrol | 761 lbs. | 761 lbs. |
| Oil | 95 lbs. | 95 lbs. |
| Total Weight Fully Loaded | 6,516 lbs. | 7,116 lbs. |

**Loading—**

| | |
|---|---|
| W/HP. (with 6,516 lbs.) | 13.1 lbs. |
| W/HP. (with 7,116 lbs.) | 14.2 lbs. |
| Lbs./sq. ft. (with 6,516 lbs.) | 10.5 |
| Lbs./sq. ft. (with 7,116 lbs.) | 11.5 |

**Total Area of Main Planes—**
618 square feet.

| **Performance—** | With 8 Passengers. | With 2,200 lbs. Freight. |
|---|---|---|
| Speed at 1,000 ft. | 128 M.P.H. | 124 M.P.H. |
| Speed at 5,000 ft. | 125 M.P.H. | 121 M.P.H. |
| Climb to 10,000 ft. | 20 mins. | 25 mins. |
| Ceiling | 16,000 ft. | 15,000 ft. |
| Endurance (full speed at 5,000 ft.) | 3.3 hours (413 miles) | 3.3 hours (400 miles) |

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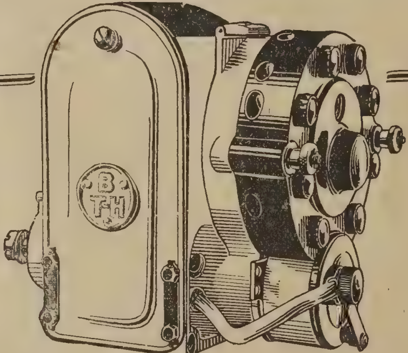

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# AERONAUTICAL ENGINEERING

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## THE WEEKLY COMMENTARY.

An article by Capt. Sayers suggests the possibility of an entirely new method of aerial navigation, which will render aircraft independent of either ground or sky observations from the time of leaving earth till arrival at the destination.

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A photograph and such information as it is yet permissible to publish concerning the new 1,000-h.p. Napier "Cub" aero engine appears on page 134.

To found a new aircraft manufacturing company at a period when the majority of existing concerns of that type are meditating a complete cessation of business requires at least courage and faith. That the De Havilland Aircraft Company should have had such courage and faith and that it should have been rewarded by orders is a hopeful sign. Some particulars of the first of the machines which this firm has completed are given in this issue.

* * *

## A POSSIBLE NEW METHOD OF MEASURING DRIFT.

To suggest that there is any connection between the soaring flight of birds and the possibility of developing entirely new methods of navigating power-driven aircraft may seem to be a far-fetched suggestion.

Yet it can be shown that a consideration of the elementary mechanics of the flight of a gliding bird in a wind will lead eventually to conclusions which indicate that there are possibilities of measuring changes of wind velocity by their effects on an aeroplane which is flying in that wind without any observation of either the earth or the stars.

Readers of recent articles dealing with soaring birds will recollect that firstly it was shown that in the main observations of the manœuvres of soaring birds were consistent with the theory that their flight was due to the existence of an upward air current.

This demonstration failed to satisfy certain readers, who advanced the theory that the bird stored energy by acquiring a high land speed down wind and then turned up wind and used that energy to gain height.

It was then shown that this process could not produce the supposed effect because the surplus kinetic energy gained down wind was in turning given back to the wind whence it came.

### Of Flight in Steady Winds.

Generally this truth extends much further than the particular case of turning from down wind to up wind. It may be said generally that the bird cannot by any conceivable manœuvre in a steady horizontal wind gain air speed without a loss of height, and cannot gain height without a loss of air speed, unless he expends muscular energy in the process.

Thus the bird may gain air speed by losing height and then regain height by losing the increased speed, but he can regain no more height in the second manœuvre than he lost in the first unless his final air speed is less than his initial air speed, and therefore he cannot continue to gain height by any such process as it will bring him finally to an air speed which no longer supports him.

### The Case of Varying Wind.

This statement, however, applies only to steady winds. If a bird is flying at a steady air speed in still air and a headwind rises while he is flying, the bird will lose ground speed in such a way that his air speed remains approximately constant. But that air speed does not remain absolutely constant.

For while the wind speed has been changing the bird's speed has also been changed, and as the bird has mass or inertia a force must have acted on the bird to change his speed.

This force can only be due to the change of wind speed, and it is obviously of the nature of a change in the bird's resistance and it must mean that there is a change in the bird's air speed—*i.e.*, it implies that the bird does not change his ground speed quite as rapidly as the wind speed changes. Therefore in this case for the whole of the time the head wind is increasing the bird has a small but definite excess air speed, and therefore excess lift, and he can rise in that increasing wind. But a wind cannot go on increasing indefinitely, so that soaring cannot be accounted for thus simply.

### The Measurement of Wind Changes.

Nevertheless this consideration shows that any change in wind speed must produce a force acting on any aircraft flying in that wind and that if that force is measurable the change in the wind speed is *ipso facto* also measurable.

If changes in wind speed which occur during the flight of an aircraft can be measured on the aircraft without reference to any external object all such corrections of course as are rendered necessary by these changes of wind speed can be made and therefore a true course can be kept without any observation of objects which are not affected by those changes of wind speed.

That is to say that it will become possible to steer a true compass course without observation of anything outside the aeroplane itself.

Consider the case of an aeroplane flying at a steady velocity in a straight line on a defined compass course That aeroplane is struck by a side wind which increases to a definite speed. Owing to the inertia of the aeroplane it does not at once take up the speed of the side wind, and consequently there is a transverse air velocity past it. This air velocity produces a transverse force on the aeroplane, and this force accelerates the aeroplane in the direction of the wind until the aeroplane obtains the steady velocity of the side wind in addition to its original air speed.

The aeroplane is then drifting sideways at a speed equal to that of the new wind which has arisen. It is obvious that if it is possible to measure the force of the wind acting on the aeroplane during the time when the aeroplane is moving sideways at a velocity less than that of the wind it will be possible to compute the resulting transverse acceleration.

Knowing the time during which the acceleration has continued, the resultant transverse velocity—which is the rate of drift—can be computed.

Forces analogous to those which accelerate the aeroplane sideways will operate upon any vertical fin surface attached to the aeroplane and sharing its movement, and these forces therefore might be used to measure those on the aeroplane as a whole.

### A Proposed Drift Meter.

This is the underlying idea of an instrument patented by Messrs. W. H. Tripp and C. E. Wilkins, of the Thomason College, United Provinces, India. Briefly this instrument consists of a vane, arranged to present its edge to the normal relative wind past the aeroplane, carried on a parallel link motion, and displaced against a spring by any side wind relative to the machine.

By the use of a very ingenious integrating mechanism the displacement of this vane is used to measure certain quantities which, the inventors claim, approximate to the rate of drift of the machine at right angles to the compass course, and the sum total of the distance drifted.

### Some Serious Defects.

Unfortunately, despite the soundness of the basic idea, the inventors have gone astray in their application. The vane is caused to measure not the acceleration force acting transversely on the machine, but the relative transverse air speed past the machine, otherwise the difference between the drift speed of the machine and the transverse wind during a change in the wind speed.

For any one gust only the maximum value of this speed difference is taken account of, and apparently it is assumed that this difference measures the ultimate drift speed taken up by the machine.

This would only be true if gusts were of infinite acceleration, *i.e.*, if a gust always rose to its full velocity instantaneously. Then at the very beginning of the gust the transverse slip of the machine would be equal to the ultimate drift rate caused by the gust.

In practice wind gusts change speed at all sorts of rates, but never at an infinite one, and the assumed relation would by no means hold.

Also a side slip produces a relative wind, and this relative wind, acting on the vane, would give a reading on the vane corresponding to a gust in the opposite direction, and the result of such a side slip would be to cause the instrument to show that the machine had drifted in one direction a distance equal to that which it had actually slipped in the opposite direction.

Thus this instrument actually is a slip indicator, and instead of showing the actual drift relative to earth it shows how much less leeway the machine has made than it would have made had it no inertia.

### An Insuperable Difficulty.

This consideration will show that there are difficulties to the use of the air forces which must act on a machine to alter its rate of drift to measure the amount of that drift.

For these forces due to a relative side wind cannot be distinguished from those due to any such wind however caused. But whereas the forces which cause a change of drift are forces producing an acceleration and an actual change of velocity over the earth, forces due to side slip are forces which balance a component due to gravity, and prevent the speed of side slip increasing.

In the first case the force only exists while the machine is altering speed, in the second they continue during the whole time the machine is in steady motion, and the steady motion in the latter case is in the opposite direction to that which results from the acceleration of the first case.

This difficulty appears to be insuperable, and therefore it seems impossible to measure the accelerations produced on a machine by wind forces by measuring air forces acting on a surface attached to that machine.

### An Alternative Method.

But from the fact that the air forces which change the velocity of the machine in any way must produce an acceleration of that machine, whereas any wind force which is the result of a steady velocity on the part of the machine does not produce an acceleration, it becomes obvious that if any method can be devised to measure and record all the accelerations to which a machine is subject, the velocity of that machine during its whole flight can be computed.

As an example, consider the case of side drift due to a cross-wind. The machine does not possess any side drift when standing on the ground, and therefore between leaving the ground and settling down to steady flight it must suffer an acceleration due to this wind. If this acceleration can be measured accurately during its whole period of action, the resulting rate of drift at any time can be determined. Having once settled down to a steady rate of drift no change in that rate can occur without a further acceleration, which can again be measured and the change of drift rate computed.

### An Early Proposal.

This is true not only of drift, it is true of changing velocity of any kind, and this fact was clearly recognised many years ago by the late E. V. Fisher, the well-known early Brooklands pilot, who proposed the use of three sets of accelerometers arranged to measure accelerations in three planes mutually at right angles one to another, the complete set being oriented as to north and south by a gyroscopic compass.

Then providing that a satisfactory mechanical integrating device could be designed the instrument proposed would be able to give at any moment the horizontal speed, its direction, and the vertical speed, and the total distance made good, the direction made good, and the height attained, all relative to the starting point on earth.

The mechanical details of such an instrument would, of necessity, be extremely complex and a very high degree of sensitivity would be required to give results of a high order of accuracy.

Nevertheless the instrument is physically possible, and it is understood that Mr. R. L. Howard-Flanders, with whom Mr. Fisher was closely associated in the early days of Brooklands, has developed the idea and has arrived at a practical scheme for an instrument which should be capable of taking account of all the accelerations which act upon it, and give a continuous record of the position of the instrument relative to the starting point due to any movements to which it has been subjected.

Whether it will ever be possible to attain with such an instrument the combination of sensitiveness, accuracy, compactness, and low weight needed for aircraft of the type now existing is difficult to predict.

### A Simplification.

But a very much less complete solution of the general problem would serve greatly to increase the accuracy of present-day aerial navigation.

The air speed and the compass course of any aircraft can already be measured to within tolerable limits of accuracy. By far the greatest source of doubt in air navigation problems is the amount of drift made on a given journey. The wind velocity and direction at the starting point, and therefore the rate of drift at the beginning of the journey, can be directly measured from the ground, and if changes in the rate of drift which occur during the journey can also be measured without further reference to the ground a great step forward will have been made.

There are many forms of accelerometer which can be made to measure the forces tending to change the velocity of an aeroplane in flight. There are a number of mechanical integrating devices known which can be made to sum up the indications of such an accelerometer to give both the resulting velocity and the total distance travelled under the influence of those accelerations, and therefore a drift indicator depending solely on the accelerations which can be detected on the machine itself is physically possible.

### Difficulties to be Overcome.

The problem of designing such an indicator is well worth attacking. It is a problem presenting many difficulties. Of these probably the most serious is that due to the great range of sensitiveness required of the instrument.

Winds may change in velocity at widely different rates. Starting with a calm, a wind may rise very slowly and steadily to say 10 m.p.h. at the end of an hour. An aeroplane flying during that hour may start with no drift and finish with 10 m.p.h. drift. The lag due to inertia will be negligible in this case.

On the other hand very much more violent changes of wind occur in gusty weather, and a change of wind velocity at the rate of 20 m.p.h. per minute may be encountered for a short time. With such violent changes the mean acceleration of the machine may be appreciably lower than the wind acceleration.

But certainly the instrument will require to take due account of accelerations varying between about two m.p.h. per hour and 10 m.p.h. per minute. The latter figure represents an acceleration 300 times as great as the first, and the force acting on the accelerometer will vary in this same ratio.

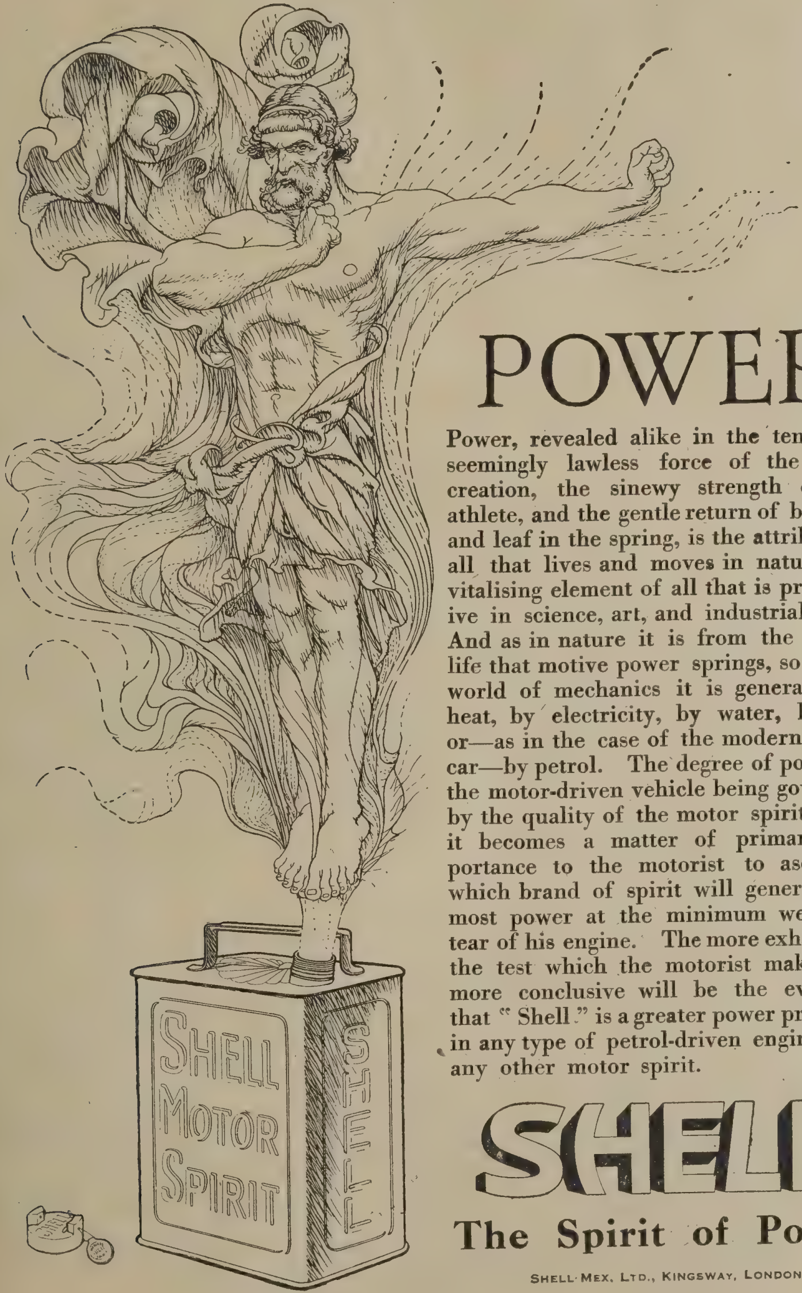
Now the small acceleration will produce the same total rate of drift as will the large one, if it persists long enough, and therefore a reasonable equality of accuracy in measuring forces of such widely different magnitudes is necessary if the instrument is to be of use.

But it would be distinctly unwise to suggest that the necessary accuracy cannot be attained, and the value of such an instrument for long distance flying is so great that every effort should be made to develop this method of measuring drift.—W. H. S.

## THE ROYAL AERONAUTICAL SOCIETY.

At the meeting of the Royal Aeronautical Society held on the afternoon of Thursday, Feb. 3rd, Mr. G. S. Simpson, C.B.E., F.R.S., Director of the Royal Meteorological Society, being in the chair, a paper by Major G. Dobson on "Meteorology in the Service of Aviation" was read and discussed, and followed by a second paper, entitled "Ground Engineering," read by Lt.-Col. H. W. S. Outram.

These two papers and the discussions thereon raised a number of points of general interest, and despite the wide difference between the two subjects there are certain relations between the questions which they raise. It is hoped that it will be possible to deal with these points in some detail at an early date.



# POWER

Power, revealed alike in the tense and seemingly lawless force of the brute creation, the sinewy strength of the athlete, and the gentle return of blossom and leaf in the spring, is the attribute of all that lives and moves in nature, the vitalising element of all that is progressive in science, art, and industrial craft. And as in nature it is from the mystic life that motive power springs, so in the world of mechanics it is generated by heat, by electricity, by water, by oil, or—as in the case of the modern motor car—by petrol. The degree of power in the motor-driven vehicle being governed by the quality of the motor spirit used, it becomes a matter of primary importance to the motorist to ascertain which brand of spirit will generate the most power at the minimum wear and tear of his engine. The more exhaustive the test which the motorist makes the more conclusive will be the evidence that "Shell" is a greater power producer in any type of petrol-driven engine than any other motor spirit.

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# THE NAPIER "CUB."

That the firm of D. Napier and Son, Ltd., were constructing a new engine of greater power than their well-known "Lion" has been known for some considerable time.

This particular engine has been designed for the Royal Air Force and in general it was considered desirable that details of the actual design should be withheld. By some means, however, certain information as to the engine reached the general Press during the course of last week and was published by them, and it has therefore become permissible to give a certain amount of accurate information on the subject, together with the attached photograph of the engine in question—the Napier "Cub."

No detailed technical information as to the dimensions or the construction can be published at present, and therefore one can only be very general in describing it.

The engine consists of four rows each of four cylinders arranged as an irregular cross round a common crankcase. The angle between the two upper rows is very considerably smaller than that between either one upper row and the nearest lower row or the angle between the two lower rows. Between the two lower rows the crankcase protrudes downwards to form a sump, and into the front end of that sump are cast the carburetter bodies, consisting of a common float-chamber and four jet-chambers—one for each row of cylinders.

The angle between each upper cylinder block and its corresponding lower block is 90 deg., and the angle between the two upper blocks is apparently 45 deg., leaving 135 deg. for the angle between the two lower blocks.. Onto the upper half of the crankcase is cast half the housing for a reduction gear. This housing follows on a large scale the outlines of the gear casing of the "Lion."

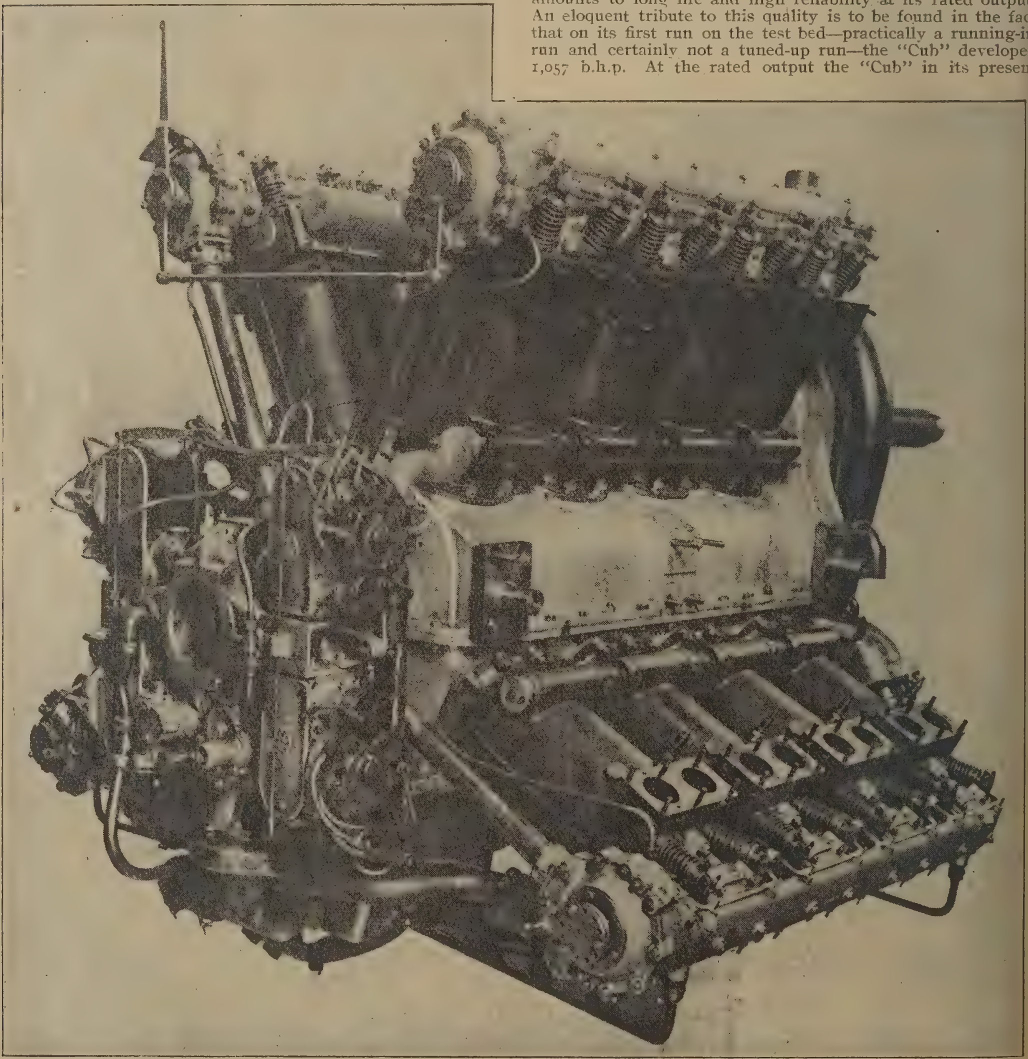
At the far end from the crankcase is the casing for the valve gear, magneto and pump drives. Each cylinder is a separate unit of steel with steel sheet welded jackets. There are four valves per cylinder, each valve protruding outwards in such wise as to indicate that the cylinder heads are domed.

Unlike the valves of the "Lion," these valves are operated by rocker-arms from a single central camshaft, each rocker-arm projecting diagonally from the camshaft casing, a very ingenious but not yet describable mechanism being provided to compensate for the side-thrust which this arrangement of valves and rockers appears to apply to the valve stems.

The upper half of the crankcase is provided on each side with three seatings for bearer brackets, so that brackets of any suitable form and dimensions may be applied.

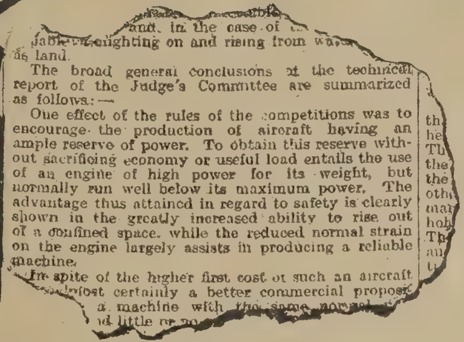
Although in appearance and in detail design the "Cub" obviously differs considerably from the earlier "Lion," both engines are extremely compact and clean of outline.

Nominally of 1,000 h.p., the "Cub"—like the "Lion"—has been designed for ample reserve power, which in other terms amounts to long life and high reliability at its rated output. An eloquent tribute to this quality is to be found in the fact that on its first run on the test bed—practically a running-in run and certainly not a tuned-up run—the "Cub" developed 1,057 b.h.p. At the rated output the "Cub" in its present



THE WORLD'S MOST POWERFUL AERO-ENGINE.—The 16-cylinder 1,000-h.p. Napier "Cub," which has just successfully completed preliminary tests, developing well over its rated power at the first time of asking.

# The Napier's Proved Safety and Reliability



and, in the case of
...ighting on and rising from wa
as land.

The broad general conclusions of the technical report of the Judge's Committee are summarized as follows:—

One effect of the rules of the competitions was to encourage the production of aircraft having an ample reserve of power. To obtain this reserve without sacrificing economy or useful load entails the use of an engine of high power for its weight, but normally run well below its maximum power. The advantage thus attained in regard to safety is clearly shown in the greatly increased ability to rise out of a confined space, while the reduced normal strain on the engine largely assists in producing a reliable machine.

In spite of the higher first cost of such an aircraft ...most certainly a better commercial propos... a machine with the same normal ... d little or no

*Extract from "Times" of Report on Govt. Aircraft Trials.* 11.1.21.

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Shall we send particulars?

**It is a significant fact that the only Engine fitted to the Aircraft to secure the Highest Prizes in the three classes of the British Air Ministry Competitions — on whose performances the above remarks are based — was the**

## NAPIER

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Works, Acton, London, W.3.

form ranks among the lightest engines in the world. Its weight is stated not to exceed 1 ton or 2.24 lb. per h.p.

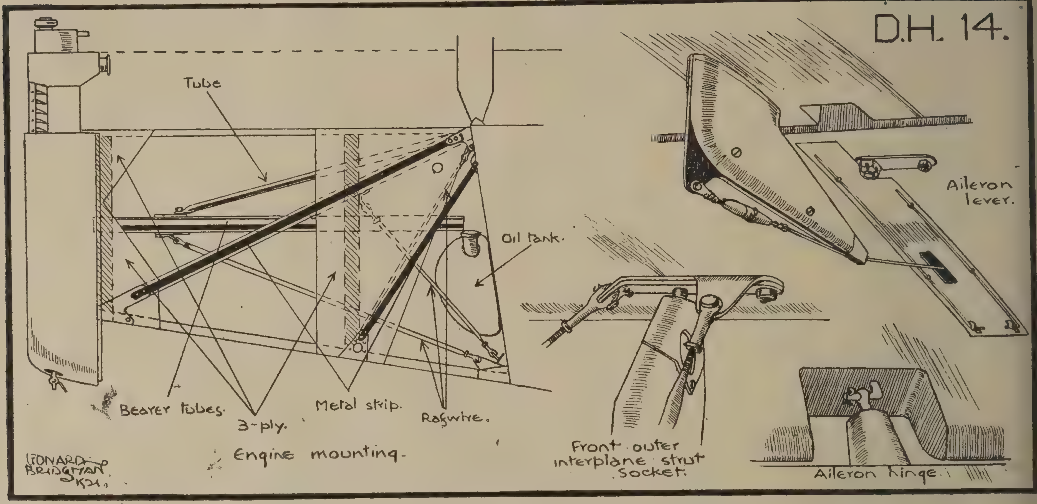
The extremely satisfactory result of the tests of this engine, together with the very excellent commercial results of Napier's enterprise in carrying on the development of aero-engines, should serve as a lesson to some of those pessimists now so common in aeronautical circles.

At the conclusion of the Armistice Napier's were the builders of a promising but not proved aero-engine. Confidence in their own product and a determination to make it an acknowledged success have led to their expending time and much capital on that engine.

To-day they have orders on hand for "Lions" which amount to hundreds of thousands of pounds, and the success of the "Lion" has justified the Air Ministry in entrusting to them the development of the "Cub."

Had all those who made money out of aviation during the war shown the enterprise and the courage shown by Napiers, and had they had the same real ability, the Aircraft Industry would now bear a different aspect.

## THE DE HAVILLAND AIRCRAFT CO.'S FIRST PRODUCT.



**Some Structural Details of the 600-h.p. D.H.14 Bomber.**

The D.H.14, a short description of which, with scale drawings, was published in The Aeroplane for April 28th, 1920, was designed by Capt. G. de Havilland just prior to the Armistice as a high-powered day-bomber, but owing to the cessation of hostilities the construction was suspended. The de Havilland Aircraft Co. have recently been asked to carry on with the construction of a number of these machines for the Air Ministry, and now that the Rolls-Royce "Condor" engine, for which the design was prepared, is available, the construction is proceeding fairly rapidly.

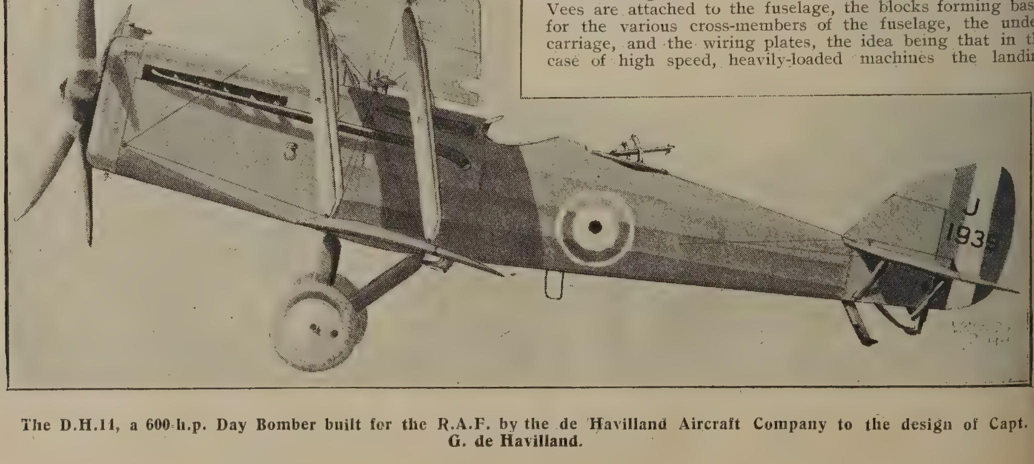
Outwardly the D.H.14 resembles some previous D.H. machines, more particularly the D.H.9a, but constructionally there are many departures from the earlier designs. It is a two-seater tractor biplane fitted with a 600-h.p. engine.

In the rear of the engine is a fireproof bulkhead. The oil tank is situated in front of this bulkhead below the engine, whereas the petrol tank is carried just in rear of the bulkhead. The gravity tank is in reality the upper portion of the main tank. Pressure is maintained by two independent windmill pumps situated on top of the fuselage below the centre section.

The pilot is situated aft of the main planes, with the observer in a separate cockpit behind. For purposes of offence the D.H.14 is fitted with internal bomb-racks for 6 112-lb. bombs carried in two double and two single bomb-carriers, the former situated just in front of the pilot's cockpit between the front and rear legs of the undercarriage, and the latter directly under the pilot's seat.

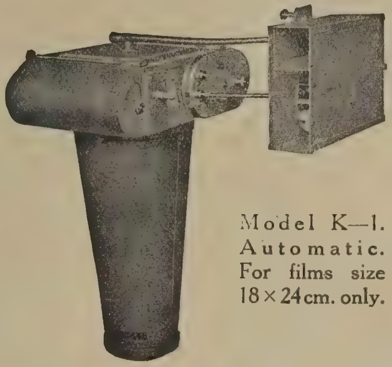
The defensive armaments consist of one stripped Vickers gun on the left of the pilot, and a Scarff ring on the observer's cockpit, for either single or double Lewis guns.

The fuselage is built up of four longerons, with the usual cross struts braced with streamline wires. Instead of the previous method of joining the front and rear portions of the fuselage with a splice, the longerons are made up of a series of short straight lengths with aluminium blocks inserted between each length. Four of these aluminium blocks, two on each longeron, occur at points where the undercarriage Vees are attached to the fuselage, the blocks forming bases for the various cross-members of the fuselage, the undercarriage, and the wiring plates, the idea being that in the case of high speed, heavily-loaded machines the landing



**The D.H.14, a 600-h.p. Day Bomber built for the R.A.F. by the de Havilland Aircraft Company to the design of Capt. G. de Havilland.**

# Aerial Photography



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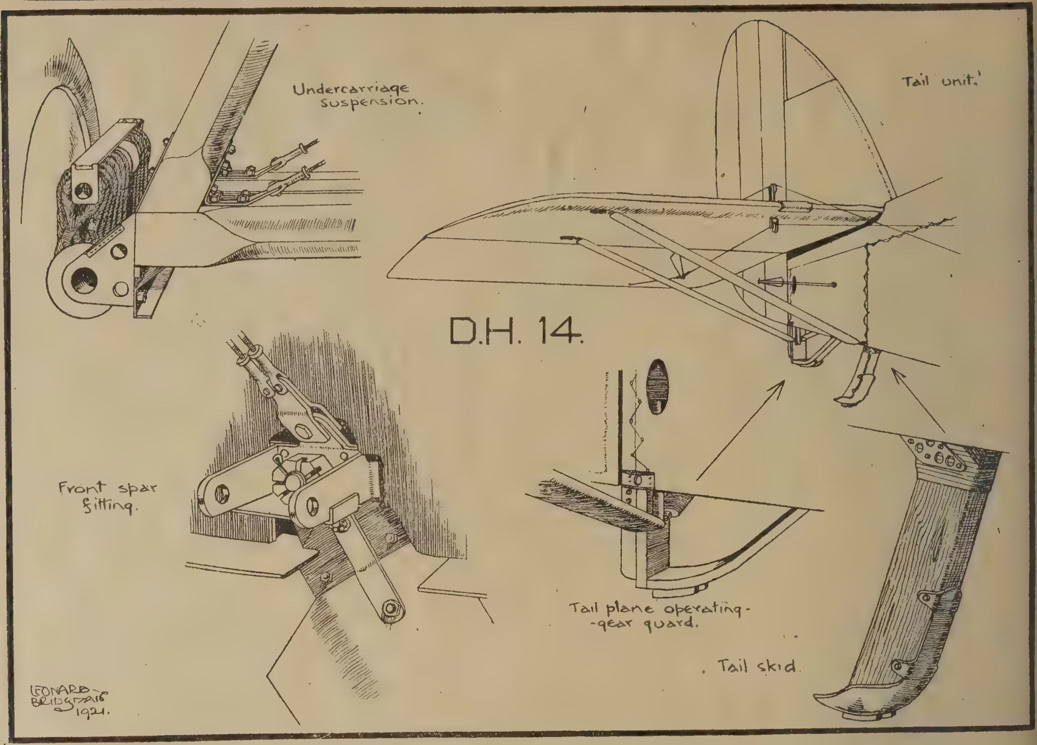

stresses are absorbed by these blocks instead of crushing, and consequently weakening, the lower longeron.

The fuselage is fabric covered from the fireproof bulkhead aft, the sides being slightly bulged.

The tail plane is of normal D.H. design, with the exception that no upper bracing is fitted so as to give the back gunner an increased arc of fire.

The centre section is carried on four outwardly splayed centre section struts. The main planes are of normal design and are fitted with two pairs of spruce interplane struts on either side of the fuselage. Ailerons are fitted to both top and bottom planes, and are hinged as shown in one of the accompanying sketches.

The undercarriage, barring its attachment to the fuselage, is of normal D.H. type consisting of two streamline wooden Vees joined at the apices by a streamline wooden member in which the steel tube axle rests. The axle suspension is shown in a sketch, together with a number of other constructional details.

SPECIFICATION OF THE D.H.14.

| | | | |
|---|---|---|---|
| Span | 50 ft. 5 in. | Gap | 6 ft. 5 in. |
| Chord | 6 ft. 6 in. | Weight (empty) | 4,484 lb. |
| Area of main planes | 618 sq. ft. | Weight per h.p. | 12.7 lb. |
| Tank capacity | 178 gall. | Speed at 10,000 ft. | 122 m.p.h. |
| Weight (loaded) | 7,664 lb. | Rate of climb at 10,000 ft. | 400 ft. per min. |
| Weight per sq. ft. | 12.4 lb. | | |
| Length | 33 ft. 11½ in. | | |

## BIG SHIPS OR—?

The following notes by a Naval Officer with considerable active service experience of ships and aircraft are of considerable interest:—

The problem of capital ships in relation to aircraft is undoubtedly difficult, but I do believe in the torpedo-carrying aircraft as a method of attack against the big ship, in that it is capable of development to such an extent as to become a very serious menace. The present torpedo can be immensely improved, and can be run with unfailing accuracy without leaving the slightest visible track. Granted that its present track is only visible some time after the torpedo has passed the ultimate point the track shows, it is still enough to show fairly accurately the direction of the torpedo, which can be dodged, as at Jutland. Also the aircraft must be capable of functioning in any weather that the capital ship can fight in.

At the present moment I am inclined to believe in a combination of capital ship and aircraft carrier, *i.e.*, a ship that has heavy guns, and at the same time a defensive outfit of fighting aircraft for downing the enemy's torpedo carriers. The latter type I take it should be fairly easy prey to a fighting 'bus, at any rate before they have dropped their torpedoes.

The real problem then arises as to how to combine the two types without interfering with the separate functions of either. The capital ship must have clear deck space for her guns, and the 'bus must have *some* space to kick off from —the system of flying off platforms resting on the heavy guns is obviously impossible—also room for stowage, and preferably room for landing on the ship itself instead of flopping into the sea and having to chance being picked up and got inboard, always a lengthy process. I used to think of a ship like our *Hood* but with a tail just awash stuck on her, from which one could run off seaplanes, a kind of dock stunt. And alternatively they could run in again when their job was done, and possibly pick up lines floating astern and be hauled in. It would of course increase the tonnage and affect the lines of the ship, but not, I think, to any insuperable extent. Seaplanes, it is true, provide the facilities for acquiring that knowledge.—

B. D. H.

## THE AMERICAN AIRCRAFT CARRIER "LANGLEY."

It would appear that the American Naval Authorities have no qualms as to the present relative importance of "Big Ships" and "Aircraft" as naval weapons. For whereas the American Navy is building capital ships at an unparalleled rate, it is content to use a converted fleet collier as an aeroplane carrier. This ship, once the *Jupiter*, now re-christened *Langley*, is now nearly complete. The whole of the coal-handling plant has been removed, and the coal stowage place has been converted into workshops and aeroplane stowage space.

A flying deck, 56 feet above waterline, 525 feet long, and of about 65 feet beam amidships, has been erected over the original structure, and the funnel has been diverted into a horizontal tube running across the ship below the flying deck, and fitted with dampers arranged so that smoke may be discharged to either side.

Lifts are to be fitted to raise aircraft from the holds to the flying deck, and overhead travellers below the deck allow distribution of machines between the different hatches.

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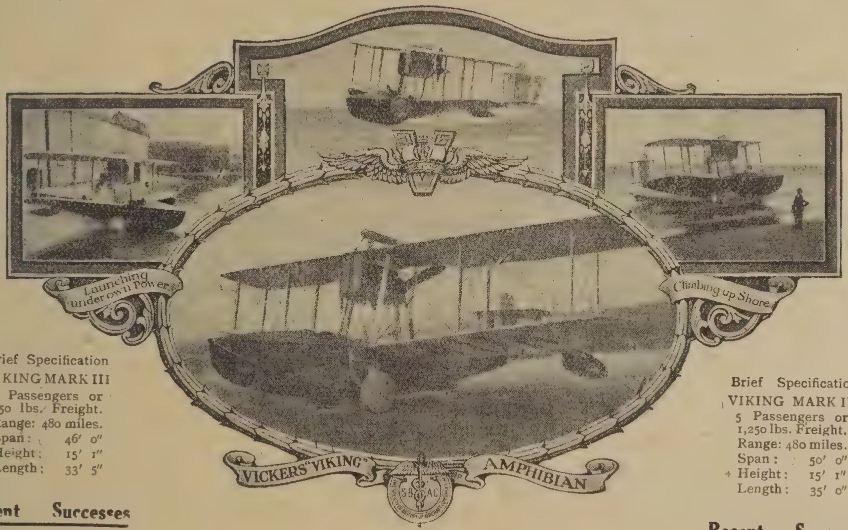

Brief Specification
VIKING MARK III
5 Passengers or
750 lbs. Freight.
Range: 480 miles.
Span : 46′ 0″
Height : 15′ 1″
Length : 33′ 5″

Brief Specification
VIKING MARK IV
5 Passengers or
1,250 lbs. Freight.
Range: 480 miles.
Span : 50′ 0″
Height : 15′ 1″
Length : 35′ 0″

Recent Successes

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

1. Shortest time in "unsticking" from water.
2. Fastest time over a given circuit.
3. Climb to 1,000 metres.
4. Altitude with full load.

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NEWCASTLE—Commercial Union Buildings, Pilgrim Street.
GLASGOW—Vickers House, 247, West George Street.
BRISTOL—55, Park Street. BELFAST—26a, Arthur Street.
LEEDS—Greek Street Chambers, Park Row.
NORWICH—16, White Lion Street.

Recent Successes

The Vickers Viking was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION September. 1920

Aviation Department,
VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

Palisade wind screens are fitted round the lift hatches on the flying deck, so that machines may be unfolded or folded in safety.

Adequate cranes for lifting seaplanes from the water are fitted. The ship is to carry twelve single-seater fighters, twelve two-seater reconnaissance and spotting machines, four wheeled torpedo-carrying machines, and six torpedo seaplanes.

Petrol storage is provided to the extent of 578 tons. The main dimensions of the *Langley* are :—

| | | | |
|---|---|---|---|
| Length overall | .........542 ft. | Displacement | ...12,700 tons |
| Beam | ........................65 ft. | Fully loaded. | .......19,360 tons |
| Speed | ..................15 knots | Armament | ....Four 5-in. guns |

## THE LOG OF H.M.A. R.34.

THE LOG OF H.M.A. R.34. By Air Commodore E. M. Maitland, C.M.G., D.S.O., A.F.C., R.A.F. With a Letter from Rudyard Kipling. Illustrated. 10s. 6d. net. (Hodder and Stoughton.)

Each one to his profession, and Commodore Maitland's *métier* is to perform great deeds in a quietly brave manner, as those who know him can testify. We cannot thank him sufficiently for the progress and discoveries made in parachuting, but literature will hand him no laurels.

The introduction sums up the man and his book. Modesty and the courage to tell the reader that he will be able to lay the book down at any time, to light his pipe, and—talk politics.

There is no sign of the writer's nature and character, and only those who know him and the crew and the working of things "airshipian" will be able to follow his book with real interest, the interest he desires to engender. It is in no sense a story, but a very technical diary, and though the writer wishes to do so I do not think he will take many of "those who do not know" with him on his trip.

"Depression" is the word most often repeated, and I think we should cast a new word to replace it. A great opportunity for a real story has been sacrificed to the useful and necessary, though ever dry, statement of facts.

The shining light in the whole log is Harris and his divinations and deductions. Either he is a marvel or the science of weather-reading is almost perfected. In the branch of aeronautics in which we are accustomed to look for the least accuracy he is as confident as a technical man should be.

I am sure Shotter cannot read the log without thinking a little. That in 1919 airship motors should need a rest every few hours should not be admitted to the public. It is not so, and if I were a great financier, ready to put money into commercial airships, the reading would not tend to encourage me.

From the other technical viewpoint it would appear that the solution of such air travel is to envelop the airship in a perpetual cloud all its own. But there are pilots who had had more sea flying experience than Major Scott. I think there were Zeppelins destroyed before R.34 was built that were better fitted for such a trip commercially, except only in weather matters.

Whatever dampening effects the book may have on English readers, it will leave the German air people quite cold, that I am sure. And if anything was "learned" from a technical standpoint it was nothing but what was already known and catalogued elsewhere.

R.34 and its crew had the honour of first crossing and re-crossing the Atlantic, but we are no further advanced in the direction we wish and need to go by reading its log.—A. J. CORBITT.

Nanterre, Seine, Jan. 27th, 1921.

## THE HOWARD LECTURES.

The second "Howard" lecture on aero-engines was delivered by Mr. A. E. L. Chorlton at the Royal Society of Arts on the evening of Jan. 24th.

In this lecture the general trend of development of aero-engines during the war was outlined. It was shown that German work was almost solely confined to the improvement of the standardised six-cylinder vertical type, although efforts were made, too late for use in the war, to copy the Allied high-speed Vee type of engines. Also German developments were carried out with a view to retaining the highest possible reliability and fuel economy.

The Allies, on the contrary, experimented with and developed engines of many diverse types, including the rotary, the air-cooled radial, the water-cooled radial, the Vee, the broad arrow type, and even the four-row cross-type. Great efforts were made to keep down the weight per h.p., and Allied engines usually were more highly stressed, and probably less reliable, than the German types.

The most important advance made during the war period was the investigation of air-cooling, and although the results in the shape of satisfactory air-cooled engines were not ready for use in the war, future effects would be important. The development of engines designed to operate at high altitudes, on the super-dimensioned, super-compressed, and super-charged systems, was also briefly mentioned.

In the third lecture of the series, given on Monday, Jan. 31st, Mr. Chorlton briefly described a number of the engines which, although designed for war, were not produced till after the Armistice, together with one or two projected engines which never materialised.

He mentioned possibilities of attaining higher efficiency by such devices as injecting cooled exhaust gas to prevent detonation and then using high compressions, of working with stratified charges and direct fuel injection. The limits imposed on the speed, and consequently the output, and the weight per h.p. by the inertia loads on the big end bearings were discussed, and the lecturer showed that these loads were of greater importance as the number of cylinders acting on a single crankpin increased, and were of greatest value in the radial type, thus imposing limits to the possible speed of any engine of this type. He also pointed out that these inertia loads were a serious difficulty to any great increase in maximum cylinder pressure. The connecting rods had to be increased in strength to meet an increased maximum pressure on the piston, and must therefore be heavier, resulting in increased inertia loads, calling for larger bearing surfaces. Thus at some point an increase in maximum pressure would result in an increase in total engine weight at a greater rate than the increase in engine output.

## TO GLIDING ENTHUSIASTS.

The articles which have recently appeared in this journal relating to the soaring flight of birds has resulted in the receipt of a number of letters which indicate that a very considerable amount of interest is being taken in the general subject of gliding flight and the possibilities of soaring.

Quite a number of writers express the wish that a club or clubs should be formed to allow those interested in gliding or soaring to interchange views and to co-operate in experiment.

THE AEROPLANE finds itself entirely unable to devote any large amount of space to this interesting and educative aspect of aviation, but it will do everything possible to assist those who are interested in the subject to get into communication one with another.

Will any readers, therefore, who would like to support the formation of gliding clubs or such like institutions forward their names and addresses to the Editor? A list of those interested will then be prepared and a copy forwarded to all those whose names appear therein.

It would be well for each such reader to state whether he desires to take part in actual gliding, in the design and construction of experimental gliders, or whether his interest is likely to be mainly academical

## TRADE NOTES.

### The Aircraft Disposal Company.

During the last Aero Show at Olympia, one was sufficiently fortunate to obtain an aeroplane watch (Repaired R.A.E. 30 hr. non-luminous) from the Aircraft Disposal Co., of Regent House, Kingsway. A more surprisingly accurate timepiece one has never met. One built it into a wrist strap and hung it on one's wrist, and in actual test it has neither lost nor gained a quarter of a minute in a month! It is understood that the A.D.C. still have a few of these watches in stock, but owing to their extreme excellence the stock is being quickly exhausted.—G. D.

### A Reduction in Prices.

Downing Bros., of 230, Wood Street, Walthamstow, E.17, are now specialising in "Prop sticks," the joy of the war-time R.A.F. The whole concern is operated by ex-service men, among whom are a large majority of ex-R.A.F. personnel. Here furniture can be obtained at absurdly low prices. Full price lists may be obtained by writing to the above address.—G. D.

### An Interesting New Company.

The following appears among the latest companies registered :—

HANDASYDE AIRCRAFT CO., LTD.—Private company. Registered Feb. 1st. Capital, £100 in £1 shares To carry on the business of aeroplane manufacturers, aeronautical engineers, etc. The first directors are : G. H. Handasyde, The Vine, West Byfleet, Surrey, and H. Fulton, Byways, Berkhamsted. Registered office : 1, Laurence Pountney Hill, E.C.

### Mortgages, Charges and Satisfactions.

HANDLEY PAGE, LTD.—Mortgage and charge on agreement with Minister of Munitions relating to lands and premises, etc., in Cricklewood and company's undertaking and property, present and future, including uncalled capital, dated Dec. 31st, 1920, to secure all moneys due or to become due from company to Barclay's Bank, Ltd. The company is precluded from creating a charge ranking in priority to or *pari passu* with the above.

SUSSEX AERO CLUB, LTD.—H. Wingfield, of 67, Watling Street, E.C., as receiver and manager in January, 1921, under powers contained in debentures dated May 22nd, 1919, in place of Major C. W. Beardmore.

# IN GOOD TIME FOR 1921.

The Ideal Present for the Service or Civilian Aviator, The Technical Officer, The Ground Engineer, The Air Line Manager, The Aeroplane Designer and The Aero Engine Designer, or anybody interested in Aviation is

## "ALL THE WORLD'S AIRCRAFT" of 1920.

NOW READY.

Specifications and / or Detail Descriptions are given of **347** aeroplanes, with photographs and scale drawings.

Descriptions and specifications of **89** aero engines are given, with **151** illustrations.

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The Air Forces of All Nations are described and in most cases photographs of the Personnel and Matériel are shown.

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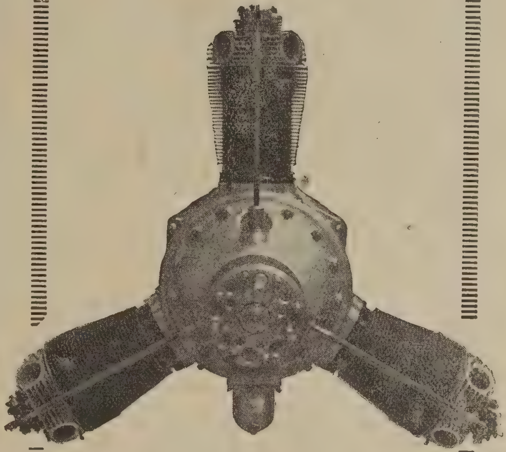
"Bristol"

# LUCIFER
Aero Engine



This engine combines simplicity of design, ease of assembly, reliability and long life with the numerous advantages incidental to an air-cooled engine.

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(*Continued from page* 128.)

that owing to insufficient training the pilots did not know how to control their engines at any considerable altitude.

One also finds a reference to the fact that when Captain H.R.H. Prince Albert, K.G., and Major Greig came to stay with the squadron for a period their habit of taking running exercise suitably dressed "caused no little interest by its novelty in the lethargic community of pilots and observers." Here again we find evidence of the lack of thoroughness in training pilots at home to be something more than merely aerial chauffeurs.

No book is perfect, but the worst faults one can find in the letterpress with this history are a few cases of wrong-spelling of the names of German machines and places. There are twenty full-page illustrations of bomb raids or the results thereof. A few of these are extremely good, but the majority of them are by no means worthy of the rest of the book. The making of good half-tone blocks from rather shallow photographs is an art in itself which does not seem to have been possessed by the particular block-maker employed in this case.

These defects are very slight compared with the vast amount of really good work in the book, and one can say quite confidently that nobody who wants to study air war as a science can do so adequately without reading carefully the History of 99 Squadron.

## THE WOMEN'S WORK.

The Women's side of the R.A.F. has not been neglected by the publishers. With all one's temerity one does not dare to review or criticise a book dealing with the W.R.A.F. Therefore this task has been handed over to a former officer of the W.R.A.F. who in these days of devastating peace deigns to honour this office with her presence:—

Eight Months with the Women's Royal Air Force. By Gertrude A. George. vi+58. Illus. (London: Heath Cronton, Ltd. 7s. 6d. net.)

This is a book which, inadequate tribute though it is to the work of the W.R.A.F., will interest and inform the outside public and bring back a host of happy memories to those who served in the Force.

The title can hardly be said to describe the book, which is a series of light impressions rather than eight months' actual experiences.

The illustrations—the work of the author—are excellent, and the scenes depicted, in chalk on brown paper, do more to describe the life than anything written in the book.

One wonders why "The Dawn of Aviation" has been chosen as the title for the frontispiece, which is a drawing of a member of the W.R.A.F. looking at two or three aeroplanes of doubtful design. One was of the opinion that aviation "dawned" before most of the personnel of the W.R.A.F. were out of their cradles.

So much has been written and spoken about the slack discipline of a handful of girls who drove Staff cars in London, and so little about the actual work of the Force, that one is inclined to think that the author has failed to avail herself of a great opportunity. She has shown a real appreciation of the cheerfulness, pluck and whole-hearted esprit de corps that pervaded the Force, and has admitted the difficulties of administration, but she leaves the uninitiated reader with the popular illusion that the Women's Services were more or less of a picnic. This may be partly due to the fact that the book deals only with the Immobile Branch, a section which lived in their own homes and only came under the discipline of the camp during working hours, being, in consequence, more trouble and less credit to the Force than the Mobile Branch.

The author has ignored some of the principal hardships, including bad rations, dope poisoning, influenza epidemics, and the evils arising from an inadequate supply of boots and waterproofs from the depot. One would have liked a word of appreciation of the R.A.F., who were always willing to lend a hand: the quartermaster who lent all the small-sized gum-boots he had in store, the serjeant-major who sent fatigue parties to help with coal and such like weighty matters, and the transport corporal who was always ready to "swing" Crossleys on cold mornings for the Wrafs.

The book tells briefly of the hard work done in the workshops and describes a small Wraf cheerfully smashing up a plane with a large hammer, but that same small Wraf would quite as frequently clean unbelievable quantities of blood from the instrument-boards of crashed machines—a less cheerful job.

On the whole the book is worth while, it is infinitely better reading than some recent fiction dealing with what is supposed to be the Royal Air Force, and at least it has the merit of being absolutely true.—C. M. S.-H.

## TERRESTRIAL AUTOMOBILISM.

From the gracious presence of the W.R.A.F. one descends to merely mechanical things. Here we have a book of interest to all who progress terrestrially, whether at times they fly or not:—

Automobiles of the World. Edited by W. E. de B. Whittaker and Captain P. A. Barron. Pp. xii+441 pages+30 pages of advertisements; 1,000 Illustrations. (The Aeroplane and General Publishing Co., Ltd. £2 2s. net.)

There can be but few people concerned with aviation who are not also concerned with automobiles in one way or another. The chief desire of the average pilot when he returns to earthly affairs is to possess the fastest possible car and to drive it at the fastest possible pace. The manufacturer of aircraft generally wishes to possess the most comfortable possible interior-drive coupé or saloon, preferably of an expensive type. Also, as a manufacturer, he is interested in automobiles as the possible or probable owner of various types of commercial vehicles, from the small delivery van to the largest thing in motor-lorries.

Equally those who are concerned with Service aviation are interested in automobiles in that mechanical transport, ranging all the way from light tenders to heavy tractors and even agricultural tractors for the proper shaping of aerodromes, are quite important matters to the effectiveness of an Air Force. Therefore all readers of this paper must assuredly be interested in one way or another in this book which, daringly but one believes justifiably, calls itself "An Encyclopædia of the Car."

As regards those who participated in its production, Major W. E. de B. Whittaker will be remembered by many readers of this paper and of the various motor papers as a one-time driver of record-breaking cars at Brooklands. There are in fact few people, even in the motor trade itself, who have a wider or more intimate knowledge of motor-cars of all types. Captain P. A. Barron is known as a writer on motoring subjects in quite a variety of papers.

The book is arranged on lines which recall those of Jane's "Fighting Ships" and "All the World's Aircraft," both of which are well known to Service people. That is to say, the various cars are arranged in a handy alphabetical order and the information concerning each car consists of a brief history of the firm, followed by a very carefully compiled and detailed specification of each car, illustrated by photographs of complete cars, bare chassis, details of the cars and/or line drawings of the chassis.

The pleasure cars of each country are arranged in sections, each section dealing with the cars of that particular country. Thus we find the first section of the book devoted to the pleasure cars of Austria, and the next section to the pleasure cars of Belgium. The commercial vehicles are arranged alphabetically according to the names of the cars irrespective of their nationality. Either way, it is quite easy to find the particulars concerning whatever car about which one may desire to acquire information.

Further to assist in discovering the cars there is a very full index in which the names of the manufacturers and the names of the cars are arranged together alphabetically, so that when one wishes to turn up a particular car and is not quite sure whether the name which one has in mind is that of the maker or of the car itself either can be discovered at once, even though the names may differ considerably, as, for example, in the case of the Abbot Downing Truck Company, which makes a vehicle called the Concord, or Clayton's of Huddersfield, who make a commercial car known as the Karrier.

Some idea of the book may be gathered when it is said that it includes over 300 pleasure cars and over 200 commercial vehicles, and that divided among these there are over 1,000 illustrations.

Apart altogether from people who are still concerned with aircraft, it is evident that a book of this nature must be of very great value to everybody concerned with the motor trade, as are so many former members of the R.A.F., and one suggests that readers of this paper will be doing their friends in the motor trade a good turn if they introduce "Automobiles of the World" to their notice. Any owner of a garage, for example, is continually being asked for information of one kind or another concerning cars brought in for repair or for the replacement of parts. This book at once gives him the correct address of the makers of the car and a great many important dimensions, such as tyre sizes, cylinder bore and so forth, which will help him to get what he wants for the car.

Also the numerous photographs or line drawings of stripped chassis will be of considerable use to the repair man in that they will show him how the parts are disposed in the car. This may save him a considerable number of voyages of discovery underneath the car to find out things which are hidden by the bodywork.

Also there are very many owners of cars who take a really live interest in all kinds of cars other than that which they happen to own themselves. The book will appeal particularly to this class of motoring enthusiast, and it occurs to one that owners of garages might add quite considerably to their incomes by selling copies of the book to their more enthusiastic customers.

To many readers of the book perhaps the most interesting feature of all will be the introductory Brief History of Motoring, written by Major Whittaker. It starts with the cryptic phrase, "The true history of the motor industry has yet to be written." Probably anybody who dared to produce such a history would find himself saddled with a large variety of libel actions. Nevertheless in a matter of ten pages Major Whittaker has produced a history of motoring, as distinct from the motor industry, which will present to the average reader considerably more actual news than is generally contained in a daily paper. Very much ancient history of all kinds is news to the modern reader, and certainly there is much in this brief history which will be new to modern motorists.

Having been concerned as a spectator in the compilation of the book one feels that one can say a few things that the editors cannot say themselves. One is that the American firms sent in the desired information about themselves in much better form and much more promptly than did any but a few British firms. Some British firms, with that self-sufficiency which is common among English business-men and is not unknown even in the Aircraft Industry, chose to ignore the editors' requests for specifications and photographs. Most of these very soon came to their senses when shown proof pages of what was being done for other and more intelligent firms. Others still chose to be high and mighty This may be taken as the reason why some firms' products are so elaborately illustrated and why those of other firms are shown on a smaller scale. The difference may be taken as a gauge of the intelligence—and inferentially of the quality of the products—of the various firms.

The editors have in all respects been delightfully impartial. The cars of Germany and Austria receive as full attention as those of France and England. If a few American cars are missing from the book it is because, for one reason or another, their makers have not supplied the information required. Probably their omission this year will make them the more certain of being well represented next year, or whenever the next edition may appear.

Altogether the book is remarkably good value for the two guineas charged for it, and it is produced in a style which will earn for it the respect of even those who have the most fastidious taste in the outward and internal appearance of their books And certainly nobody who wishes to pose as an authority on motoring can consider himself or herself adequately equipped without it.

## AND AERIAL AUTOMOBILISM.

Thence we ascend once more to purely aerial affairs and present what is now accepted as the standard work of reference on aircraft :—

ALL THE WORLD'S AIRCRAFT. Edited by C. G. Grey. Pp. vi + 407, + 53 pp. of advertisements; 772 illustrations. (Sampson, Lowe, Marston and Co., Ltd. £2 2s. net.)

Of course it is grossly improper for the author of a book or the editor of an encyclopædia to review his own compositions in another publication. In this instance, however, it is going to be done for the good and sufficient reason that, as editor and compiler of "All the World's Aircraft" and as editor of THE AEROPLANE also, one can do more or less exactly as one pleases, except of course tell the whole truth about some of the people concerned with aviation about whom the truth ought to be told but for one's respect for one's advertisement pages and one's fear of the Law of Libel.

As a matter of fact so far as "All the World's Aircraft" is concerned one is rather justified in regarding it with the eye of a critic rather than with the eye of an author or editor, in that the bulk of the work in the book has in fact been done by other people. For example, the masses of figures embodied in the various specifications of the 400 or so aeroplanes described in the book are entirely the work of Captain W. H. Sayers, late of the Technical Department, R.A.F. Personally the sight of more than three figures in a row, either vertically or horizontally, puts one into a flat spin. Captain Sayers, on the other hand, likes figures of the mathematical kind and revels in calculations with or without a slide-rule. Therefore the figures in the book have been left to Captain Sayers, and one is justified in claiming not only that they are amazingly accurate but that they are extremely informative to those who wish to acquire information concerning the dimensions and performance of the aircraft of all nations.

Credit must also be given to Mr. Erik Hildesheim for his efforts to procure reliable facts concerning the more modern German aeroplanes and engines. The German Aircraft Industry, naturally feeling a trifle peevish with this country after the war, was not anxious to hand over up-to-date information concerning their latest products. Mr. Hildesheim, who has a remarkable knowledge of the inside of the German Aircraft Industry, soon persuaded the chief people of the German aircraft trade organisation that refusing information for "All the World's Aircraft" was merely cutting off their noses to spite their faces, and that the more information concerning German aeroplanes that was published in "All the World's Aircraft" the better would be the advertisement which the German Aircraft Industry would receive. As a result there is an amazing amount of most interesting information about the development of German aircraft and engines in the latter part of the war and since the war. Mr. Hildesheim's activities have also produced some quite valuable information concerning aircraft in Austria and Scandinavia.

The American Section is also unusually well done. In the first place one received a mass of material from a friend connected with the technical Press in America and after this was put into type the Secretary of the Manufacturers' Aircraft Association of America was so kind as to check all the figures and to add quite an amount of valuable information which only became available during the few weeks before the book was actually published.

The official people of some countries have also assisted very materially in the production of the book. For example, Commandant de Sablé, the French Air Attaché, went to very great trouble to correct and bring up to date the extremely detailed history of French aviation during the war which forms the preface to the French Section of the book, and the officials of the French Department of Aviation most kindly aided his efforts. One is probably correct in saying that nowhere else is there to be found so thoroughly comprehensive an account of the growth of French Military and Naval aviation.

Captain Dunlop, of the Royal Navy of the Netherlands, has also contributed much valuable and interesting information concerning Dutch Naval aviation, and the Dutch Military Authorities have been equally kind in supplying information concerning the Military side. The British Representative in Czecho-Slovakia has, with the assistance of the Czecho-Slovak Authorities, provided information concerning Czecho-Slovak Military developments which are in fact quite surprising. The Latvian Military Authorities have also shown that they are to be reckoned among the air Powers of the future.

Altogether one can honestly say that one is pleased with the book, not because of one's own work, but because of the very excellent work which other people have done in it.

Some idea of the amount of information in the book may be gathered from the fact that it deals with 347 different aeroplanes and 89 different aero-engines. The engines alone account for 151 illustrations, and the book contains altogether 772 illustrations, so that one can claim that it is by no means bad value for the two guineas which the publishers charge for it.

That it is appreciated by those best entitled to judge of its value is shown by the fact that His Majesty's Stationery Office has already ordered something over a gross of copies, apparently for the Army. So far as one can discover the R.A.F. has not seen fit to order any copies officially, but one knows that quite a large number of copies have found their way into the Messes of individual squadrons and stations, and naturally the representatives of foreign Powers in this country have been among the first purchasers One foreign Power in particular is buying on what appears to be a quantity production basis.

Perhaps after all the greatest proof of the value of "All the World's Aircraft" is that even in the office of THE AEROPLANE newspaper, the staff, who are supposed to know everything offhand, find it necessary frequently to refer to it merely for information.—C. G. G.

## THE INTER-ALLIED COMMISSION OF AERONAUTICAL CONTROL AGAIN.

The *Daily Mail* of Monday, Feb. 7th, is to be congratulated upon having at last discovered a real aviation scandal. This is the fact that German aircraft surrendered to this country under the terms of the Treaty of Versailles are not being allowed to reach this country in a form in which any useful technical data can be obtained from them.

This matter was dealt with in THE AEROPLANE of Nov. 17th, 1920, in connection with the collection of remains of German aircraft which had then just been received at Grain Air Station. According to the *Daily Mail* the causes of this destruction of valuable material are quite other than those alleged by THE AEROPLANE. It is stated, firstly, that the Germans systematically pillage all material packed for transit to England so that vital portions are missing when they arrive at Antwerp, and, secondly, that in accordance with orders from the Air Ministry all such material is destroyed at Antwerp and is not permitted to enter this country.

It is alleged that France, unlike Britain, is fully alive to the technical value of this material, and presumably is handling her share of the spoils with more intelligence.

So far as can be ascertained the *Daily Mail's* account of the position is very far from accurate. There is very strong evidence that the German Technical Authorities are not in the least frightened that British designers will be able to learn as much from an examination of their already obsolete productions as they themselves have already learnt from them.

A certain amount of pillaging is transport probably occurs. British railways are not altogether free from such crimes. But the greatest damage inflicted on German specimen aircraft is that inflicted under the direction of the Inter-Allied Commission of Aeronautical Control.

In this respect there is good reason to believe that the British members of the Commission are in the main guiltless. It is to the Latin members of the Commission that the trouble may be traced. The Latins generally are of a curious temperament. Often coldly calculating and hard-headed where their private business interests are concerned, in political matters they suffer from a vehemence of passion beside which the somewhat similar qualities of the Welsh or Irish can only be regarded as rudimentary.

Very few of the business-men of France, for instance, would hesitate to buy German goods were it to their profit to do so. But discuss with such the political aspect of dealing with Germany and you will discover that he holds all things German as accursed, to be neither tasted, touched, or handled by any right-feeling Frenchman, but to be destroyed utterly whenever possible.

Argue with him that it may be expedient, in the interests of France, to restore Germany to a stable and relatively prosperous condition and he will regard you at once as an irredeemable pro-German. His attitude in this matter is largely akin to that of the temperance fanatic—who may be by no means averse from drawing dividends from companies operating licensed hotels, but who will regard as lost souls any who urge the reform of licensed houses as a more practical method of promoting temperance than the smashing up of saloon bars.

And, as far as can be gathered, this typically Latin—or probably more accurately Latin plus Celt—temperament seems strongly represented among the non-British members of the Inter-Allied Commission of Control.

It is quite possible that certain of these members are alive to the value to their own nations of evidence as to the present developments of German aeronautical engineering and have somewhat restricted the full force of their Germanophobia towards material allocated to their own Governments.

But there is practically no room for doubt that it is mainly due to their "if you see anything German smash it" attitude that Britain is receiving from Germany a pile of useless junk instead of valuable examples of the work of the extremely capable German Aircraft Industry.

On Feb. 7th the Air Ministry issued the following official statement in regard to the German aeronautical material at Antwerp, which may be read as the official reply to certain charges made in the *Daily Mail* by the Antwerp correspondent of that paper. It is issued "in view of inaccurate statements which have appeared in the Press regarding the receipt, examination, and disposal of German aircraft, engines, and other aeronautical material, assigned to Great Britain under the terms of the Peace Treaty :

"Aeronautical material surrendered by Germany under the terms of the Peace Treaty is collected by the Inter-Allied Aeronautical Commission of Control, which arranges for its allocation to the various Allied Powers.

"The material allotted to Great Britain is despatched by rail to Antwerp in sealed cases, which are opened in the presence of Belgian officials. The material is taken on charge by the Royal Air Force Port Detachment, and is carefully surveyed by special officers of the Research Department of the Air Ministry, who select those articles which appear to be of technical or scientific value.

"All material selected is shipped to the Royal Air Force experimental stations, where a considerable amount has already been collected, and is now undergoing the most minute inspection and test at the hands of experts. Several machines of various and important types are expected to be ready shortly for actual flying trials in the air. Many types of aero engines are at present undergoing running tests on the bench, and it is anticipated that very complete data will be available as a result of the experiments conducted upon them.

"The material remaining at Antwerp, after the process of selection, is handed over to the Disposals Board of the Ministry of Munitions. In accordance with the orders of the Supreme Council no aeronautical material received from Germany may be disposed of unless it is reduced to scrap. This surplus material will therefore be reduced by the Disposals Board 'in situ' and sold locally. Hitherto, however, no reduction has taken place, as the arrangements of the Disposals Board are not yet completed.

"No stores have been tampered with while in transit to Antwerp, but thefts of material are known to have occurred at earlier stages. In all cases the stolen articles have been of little commercial and of no technical value. It is also certain that pilfering took place during the period between the Armistice and the institution of the Aeronautical Commission."

## THE FRENCH SUBSIDY.

As is generally known, the system of subsidy on the French air lines last year was worked on the principle of paying in regard to each machine a sum based on the kilometres covered and horse-power of the engine or engines fitted.

The system for this year will be based not only on kilometres and horse-power, but also on the load carried, varying rates being given for passengers, weight of goods, and quantity of mail.

An air line qualifying for this subsidy must operate at least 12 machines.

With regard to the London-Paris service no subsidy will be paid if the single passenger fare is in excess of 300 fr.

# NAVAL AND MILITARY AERONAUTICS.

## GREAT BRITAIN.

### Training Naval Observers.

A Naval order states that it is considered that the development of gunnery in the future depends to a large extent on the efficiency of observation from the air. With this in view the Admiralty invite applications from lieutenants of 1918 seniority and upwards for training as observers. Officers selected will be lent to the Royal Air Force for training at one of the R.A.F. establishments. While under training they will receive full pay of their naval rank, with extra remuneration as laid down for officers under training. After qualifying, these officers will be eligible for appointment as observers in aircraft-carriers in the Royal Navy, and when actually detailed for such work will receive the allowances for qualified officers. It is anticipated that the course will not occupy more than four to five months, and during that time officers will retain their rank and wear naval uniform.

### To No. 9 Squadron, R.N.A.S.

A meeting was held on Jan. 30th of certain members of No. 9 Squadron, R.N.A.S. (later 209 Squadron, R.A.F.), to arrange a reunion dinner of the members of that squadron. It was decided that a dinner shall be held on March 5th. Those who served with the squadron and would like to attend the dinner are invited to communicate with the hon. sec., Mr. A. H. Middlemiss, 74, Devonshire Road, Hackney, E.9. The price of the dinner was fixed at 10s 6d. per head.

### Rugby Football.

R.A.F. v. ROYAL NAVY.

H.R.H. the Duke of York, accompanied by Air Marshal Sir H. M. Trenchard, was present at Queen's Club on Saturday, Feb. 5th, when the Navy defeated the R.A.F. by 33 points to 3. The R.A.F. put up a very good fight in the first half, at the end of which the score stood at 8 points to 0. On crossing over, however, the Navy halves had it all their own way. Sqdn.-Leader Hicks scored for the R.A.F.

The R.A.F. team was as follows :—Forwards : Flight Lts. R. H. C. Usher, S. P. Simpson, E. F. Turner, I. C. Little, Newton, Serjt. T. Smith, Sqdn.-Leader W. C. Hicks, and F.O. W. W. Wakefield. Half-backs : Flight. Lts. A. W. Myllne and T. W. Elmhurst. Three-quarter backs : Flight Lts. O. C. Bryson and J. G. Skeet, F.O. W. Jones and A. N. Other. Back : F.O. G. A. Pennington.—C. M. S. H.

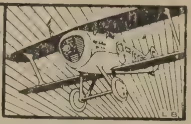
### Hockey.

R.A.F. v. THE ARMY.

At Uxbridge, on Saturday, Feb. 5th, the Army beat the R.A.F. at hockey by 5 goals to 1. The Army fielded a strong team, and the resistance offered by the R.A.F. came rather as a surprise, the backs, Sqdn.-Leader Baldwin and Wing-Com. Warrington-Morris, putting in some brilliant and consistent tackling and clearing. Bandsman Gosling, in the R.A.F. goal, also showed steadiness, helping, particularly in the second half, to keep the score down. Sqdn.-Leader Thompson scored in the second half through a fine effort by the R.A.F. forwards.

The R.A.F. team was as follows :—Bandsman W. G. Gosling, goal; Wing. Comdr. A. D. Warrington-Morris and Sqdn.-Ldr. J. A. Baldwin, backs; Flt. Lt. G. Boumphrey, Fl. Off. L. E. Wilmot, and Sqdn.-Ldr. G. R. Bromet, half-backs; Fl. Off. N. Keeble, Sqdn.-Ldr. G. E. Thomson, Flt. Off. R. W. Dawes, Flt. Lt. R. A. G. Elliott and Flt. Lt. J. M. Burd, forwards.

# COMMERCIAL AERONAUTICS AND CIVIL AERIAL TRANSPORT.



## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line: next the type of machine: next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M): next the number of passengers: and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G. E. A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

**JANUARY 31st:**

M.A., Breguet, F-CMAH, London-Paris, 13.00-16.38, G., Nil, Challoux.
M.A., Breguet, F-CMAC, London-Paris, 13.14-16.07, G.&M., Nil, Le Men.
M.A., Spad, F-CMAY, Paris-London, 12.47-15.04, G.&M., Nil, Le Sec.
S.N.E.T.A., DH9, O-BELG, Brussels-London, 12.30-15.39, G.&M., Nil, Winter.

**FEBRUARY 1st:**

M.A., Spad, F-CMAY, London-Paris, 12.45-15.00, Nil, Nil, Le Sec.
S.N.E.T.A., DH9, O-BELG, London-Brussels, 13.30-16.10, G.&M., Nil, Winter.
M.A., Breguet, F-CMAC, Paris-London, 12.43-15 30, G., 1, Challoux.
S.N.E.T.A., DH4, O-BADO, Brussels-London, 12.10-15.15, G.&M., Nil, Van Opstal.
M.A., Breguet, F-CMAH, Paris-London, 12.45-15.32, M., 2, Martel.

**FEBRUARY 2nd:**

M.A., Breguet, F-CMAC, London-Paris, 13.20—, Nil, Nil, Challoux.
M.A., Salmson, F-CMAN, London-Paris, 13.20—, Nil, Nil, Charpentier
M.A., Breguet, F-CMAH, London-Paris, 13.20-16.10, Nil, 1, Martel.

**FEBRUARY 3rd:**

NIL

**FEBRUARY 4th:**

NIL.

**FEBRUARY 5th:**

G.E.A., "Goliath," F-GEAC, Paris-London, 12.40-15.35, G.&M., 4, Patin & 1

**FEBRUARY 6th:**

NIL.

### The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

According to Air Ministry communiques no machines from Cricklewood completed a journey to the Continent.

### Air Port Statistics.

CONTINENTAL

| | | | | | | |
|---|---|---|---|---|---|---|
| MACHINES: | | | | | | |
| | Croydon | 13 | Cricklewood | 0 | Total | 13 |
| PERSONNEL.—Passengers: | | | | | | |
| | Croydon | 8 | Cricklewood | 0 | Total | 8 |
| Crews: | | | | | | |
| | Croydon | 14 | Cricklewood | 0 | Total | 14 |
| | | | | | Total Personnel | 22 |

### Inland Flying at Croydon.

Jan. 31st.—M.W.T.C., DH6, Wireless tests (Lovell).
Feb. 1st.—M.W.T.C., DH6, Wireless tests (Lovell).
Feb. 2nd.—M.W.T.C., DH6, Wireless tests (Lovell).
Feb. 3rd.—I.A.L., "Vimy," test (Barnard); M.W.T.C., DH6, Wireless tests (Lovell).
Feb. 4th.—M.W.T.C., DH6, Wireless tests (Lovell).
Feb. 5th.—I.A.L., "Vimy," joy-ride (Barnard); L.A.S., DH6, from Leatherhead and joy-riding (Muir).
Feb. 6th.—I.A.L., "Vimy," joy-riding (Barnard); L.A.S., DH6, joy-riding (Muir); Avro from Leatherhead and joy-riding (Muir).

### The London Terminal Aerodrome.

Breguets, an odd "Sneta" and a "Goliath" have made up the week's Continental work. If the weather has been fine in France it has been "dud" in England, and vice versa.

Mr. Sam Lovell has been hard at it every day doing wireless tests on his D.H.6. This machine looks rather quaint in the air with its big D.H.9 rudder.

On Saturday a new "Goliath" arrived from Paris with a full load in three hours, including a stop at Lympne to decant a Breguet pilot. On Friday two 0/400s passed close to the aerodrome, having flown to Lympne, disliked the weather and tried to return. One got back to Cricklewood safely and the other landed at Acton.

M. Boudré, who is in charge of the French interests at Croydon, is greatly rejoiced over the new French subsidies and will doubtless soon be buying cars and mansions. It appears that the air lines will reduce the London-Paris fare to £5 in April, which will just about deal the death-blow to British civil aviation unless the British subsidy is instantly revised as "incessantly expected" and hoped. At the moment no British line has run sufficiently regularly to qualify for the subsidy.

#### THE INSTONE AIR LINE.

Mr. Barnard has been giving pleasure flights in the "Vimy" during the week. On Saturday he took the machine out and climbed it very steeply over Wallington Church. Owing to the high wind the ground speed of the machine was very low during this climb and a curious effect was obtained of the church spire suddenly seeming to recede vertically below one. He was also out again on Sunday carrying passengers brought by chars-á-bancs.

The I.A.L. expect to have the "Bat" ready for pleasure flights next week-end.

#### THE LEATHERHEAD AVIATION SERVICE AT CROYDON.

For some weeks past THE AEROPLANE has noted the excellent propaganda work done at Croydon by the Leatherhead Aviation Services, of which Mr. Chapman is the moving spirit. Here for once at any rate we have a moving spirit who is moving in the right direction.

On Saturday last Mr. Chapman was kind enough to offer oneself a flight in his Curtiss-engined D.H.6. Those who only knew the old R.A.F. badly treated "R.A.F.-engined Crab" will receive the surprise of their life with Mr. Chapman's "6." The Curtiss is a nice clean and smooth running engine. The passenger's seat is roomy and the absence of draught is very notable. Though an exceptionally bumpy day the "6" never seemed to feel the bumps much. Mr. Muir took the machine across the Purley Valley (where they usually keep some perfectly good bumps) and turned back over Kenley Aerodrome, where a football match was in progress. Mr. Muir carried several more passengers during the day.

On Sunday Mr. Muir brought the Avro over and gave one a short flight in this machine. It was snowing hard at the time and it was difficult to see the ground from about 500 ft. However, in the course of a very merry flight Mr. Muir looped the machine and half-rolled out of it and so did oneself nearly. The weather was too bad to go back to Leatherhead that day, so the machines remained overnight.

Mr. Muir, who went through the Gosport course, is a very pretty pilot. His slow landings are always worth watching. He and Mr. Chapman between them keep the machines in beautiful condition and a flight in either the D.H.6 or the Avro is well worth while.

#### THE FLYING DUTCHMEN.

The K.L.M., the Dutch line which starts work in April, is already preparing to take offices at Croydon Aerodrome.

Mr. Leverton, who was traffic manager to A.T. and T., will be in charge of the English section of this air line.

Messrs. Duke and Arnold are to be two of the pilots, and in addition to Fokkers a few D.H.9s will be used at first.

It is intended to run at least one machine a day in each direction from April 1st, but doubtless this number will be greatly increased.—G. D.

### R.33 Demobilised.

The R.33 was successfully moored to the mooring mast at Pulham on Feb. 2nd. On arrival there she was transferred from the R.A.F. to the Civil Aviation Department of the Air Ministry, and has been allotted the registration G-FAAG.

For the present she will be engaged entirely on mooring mast experiments.

### Handley Page Transport.

It is understood that Major Woods-Humphrey has left Handley Page Transport, Ltd., for the Aircraft Disposal Company. He has been succeeded as traffic manager by Mr. E. Cogni, who is in charge of Handley Page publicity. Doubtless Mr. Cogni will be as successful as traffic manager as he is with the publicity department.—G. D.

## The Viking Alights on the Thames.

The Vickers "Viking III" with 450-h.p. Napier "Lion" engine carried out alighting and taking-off tests on the Thames west of Westminster Bridge on Tuesday, Feb. 8th, shortly after 15.00 hours. Piloted by Capt. Cockerell, she left Brooklands about 14.45 and alighted opposite the Houses of Parliament. He got off again, realighted and took off again several times.

The feat is not unique, having been performed by Mr. McClean in 1914 on a Short seaplane, and lately it has been done by a Fairey seaplane. It was intended as a test for the benefit of the Port of London Authority to demonstrate the possibility of using a part of their river as a port for commercial aircraft. The test was instigated by the Department of Civil Aviation of the Air Ministry, who have bought the machine.

## Changes at Hendon.

As readers of this paper are always interested in the fate of people or firms who were at one time prominent in connection with aviation it is of interest to know that the Waygood Otis Co. have recently taken over a section of the factory at Hendon hitherto occupied by the Grahame-White Aviation Co., Ltd. It is said that this firm intends starting work about this date. This ought to be good news to the people in the vicinity of Hendon, as a firm like Waygoods will certainly employ a number of people. Like other former aircraft firms, Grahame-White's have had recently to dismiss a number of workpeople.

## Huddersfield.

The Berks Aviation Co. have begun an aviation fortnight here at a site on the Leeds Road. This is the first aerial visit to the town, apparently because of the difficulty of obtaining a suitable field.

On Saturday an exhibition of stunting was given over the town football ground at half-time during the Huddersfield-Blackburn Rovers match.

# FOREIGN INTELLIGENCE.

## SPAIN.

### Subsidies for Air Lines.

According to the *El Sol* and the *El Mundo* of Madrid, of Nov. 22nd, 1920, the Director-General of Posts in Spain is inviting applications for the operation of the Malaga-Melilla and Seville-Larache air lines under the following conditions :—

(a) Malaga to Melilla.—(1) The contractor to receive a State subvention up to a maximum of 5 pesetas per km. for flights actually carried out. (2) The contractor to maintain the aerodromes of Malaga and Melilla. (3) State subvention can only be obtained for a maximum of 6 hydro-aeroplanes only, with an average speed exceeding 150 km.p.h., and capable of transporting 300 kg. of mails. The contractor must have 50 to 100 engines, spare parts, and a factory or workshop. (4) Duration of contract, 4 years.

(b) Seville to Larache.—The same conditions apply for this line except that the State subvention in this case is 6 pesetas per km., and that maintenance of aerodromes and workshops is charged to the State. This line must be operated by land machines.

## SWEDEN.

### A Good Show.

A very good performance was put up during January by Major C. H. R. Johnston, late R.F.C., and now of the Nordiska Luftrederi A/B, a recently formed Swedish air traffic company. Major Johnston, in company with a Swedish pilot named Holman, started from Brooklands on January 11th. He himself flew a Sopwith "Dove" with an 80-h.p. Le Rhone engine. Mr. Holman flew a Sopwith "Gnu" with a B.R. engine Another Swedish pilot, Mr. Gosta Andrée, had left on Dec. 22nd, 1919, on a Sopwith "Dove." Mr. Andrée was hung up in Holland for some considerable time with a broken airscrew and was still waiting for a replacement when the other two arrived in Sweden

The difficulty of the voyage was increased by the fact that Major Johnston and Mr. Holman had no mechanics with them and also experienced very bad weather all along the route. So bad was the weather that all the regular German Post lines had been suspended and consequently it was very difficult to obtain either mechanical assistance or petrol or oil. At Bremen the Germans were most obliging and helped the voyagers in every possible way. At Lübeck unfortunately the local people made themselves as unpleasant as possible. There is an excellent aerodrome at Lübeck, but that was all the advantage the aviators found there. Nobody would help them in getting petrol nor were they allowed to use the aerodrome telephone.

Despite all troubles and hindrances, Major Johnston and Mr. Holman arrived at Stockholm before the end of the month—the exact date of their arrival is not known. Altogether it was quite a good performance for them to get to Sweden at all, seeing that they were both flying strange machines with rotary engines, and as the machines were intended for joy-riding and not for flying long-distance journeys, they were naturally compelled to do the journey in short stages, each of which meant considerable delay.

# THE ROYAL AERONAUTICAL SOCIETY.

## WEEKLY NOTICES.

### LECTURES.

The next meeting will take place at 5.30 p.m. on Thursday, Feb. 17th, when Mr. F. Handley Page, C.B.E., Fellow. will read a paper on "The Handley-Page Wing."

### OBITUARY.

It is with great regret that the death of Colonel James Smith Park, M.V.O., is announced. Colonel Smith Park was one of the most active Members of the Committee of the Scottish Branch, on which he had served since its inception.

### DONATIONS.

The Council desire to acknowledge with grateful thanks the gift from Mrs. Lawrence Hargrave of a large number of notebooks, papers, negatives and lantern slides belonging to her late husband. Lawrence Hargrave did a large amount of most valuable experimental work in Australia, mainly in connection with kites, between the years 1884 and 1908, and is deservedly considered one of the most important of the early pioneers of aviation. Arrangements have been made for these records to be carefully gone through, with a view to the extraction of any data which should be put on historical record, and which has not been previously published.

### COMMITTEES.

The usual monthly meetings of the Council, Candidates Qualifications Committee, and Lectures and Publications Committee will be held in the afternoon of Tuesday, Feb. 15th.

### JOURNAL.

The February number of the *Aeronautical Journal*, which is now on sale at the Society's offices, price 2s. 6d. per copy, contains the following papers: "Airship Piloting," by Major G. H. Scott, C.B.E., A.F.C., "Airship Mooring and Handling," by Flight Lieut. F. L. C. Butcher, R.A.F. "Development of Giant Aircraft in Germany."

Royal Aeronautical Society, W. LOCKWOOD MARSH,
7, Albemarle Street, W.1; Feb. 4th, 1921. Secretary.

# PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]

### DEATHS.

DAVIS.—On Feb. 2nd, at 74, Abbey Road, St. John's Wood, N.W., of double pneumonia, Kathleen, daughter of Dr. Joseph and Christine Ozanne, of Guernsey, the dearly loved wife of Capt. Albert L. Davis, R.A.F. Channel Islands and Australian papers, please copy.

GARNER.—Observer Officer E. J. Garner, A.F.C., beloved husband of Ethel Garner, 8, Cromer Road, Tooting, drowned as a result of a seaplane accident near Constantinople, Oct. 18th, 1920.

HARVEY.—On Feb. 2nd, at South Rauncеby, Lincs., Annie Connell, the dearly-loved wife of W. A. Harvey, R.A.F.

LUGET.—On Feb. 4th, Follett Britton (Late Captain R.A.F.), only son of Mr. and Mrs. J. B. Luget, 43, Culverden Road, Balham.

McDOUGALD.—On Feb. 4th, at Ellerslie, Beddington Gardens, Wallington, Leslie Alfred, the dearly-loved and only son of Alfred McDougald, and late Captain, R.A.F., in his 31st year.

### ENGAGEMENT.

SHEARN—PITTAR.—The engagement is announced of Erroll D. Shearn (late Capt., Hampshire Regt., and R.A.F.), of Kuala Lumpur, F.M.S., and Sidcup, Kent, and Dorothy, only daughter of Mr. C. W. E. Pittar, I.C.S. (retired), and Mrs. Pittar, of Elmdene, Banbury Road, Oxford.

### MARRIAGES.

SHALES—WARNER.—The marriage arranged between Francis Harbroe Shales, Flying Officer, R.A.F., and Sylvia Violet Warner, daughter of Mr. and Mrs. J. C. Warner, St. Mary's, Winchester, will take place quietly on Thursday, Feb. 17th, at the parish church, Marylebone, London.

STONEHOUSE—BYWATER.—On Jan. 26th, ot Outwood Parish Church, Wakefield, Major Eric Childe Stonehouse (late R.A.F.), son of Sir Edmund and Lady Stonehouse, of Wakefield and Ruswarp, and Miss Phyllis Mary Bywater.

### BIRTHS.

CARTER.—On Jan. 20th, 1921, to Hilda, wife of Albert Carter, M.M (late Lieut., R.A.F), of 2602, 2nd Avenue, N.W., Calgary, Canada—a daughter.

CUCKNEY.—On Jan. 22nd, wife of Flight Lieut. E. J. Cuckney, 34, Cambridge Road, Wimbledon—a son.

HUBERT.—On Jan. 23rd, at 4, Square Desaix, Paris, to Betty, the wife of Charles Hubert, late Adjudant, Service d'Aviation Militaire—a son (Mark).

MACFARLANE.—On Jan. 23rd, at 27, Hyde Gardens, Eastbourne, the wife of Lieut. R. M. C. Macfarlane, M.C., R.F.A., attached R.A.F., of a son.

OSMOND.—On Jan. 5th, at Sliema, Malta, the wife of Squadron Leader E. Osmond, C.B.E., R.A.F., of a daughter.

ROGERS.—On Jan. 26th, at Cumnor House, Kenilworth, the wife of Major Tanner Montagu Rogers, O.B.E., late R.A.F.—a daughter.

SMYTH-PIGOTT.—On Jan. 27th, at Bodicote, near Banbury, to Wing Commander R. Smyth-Pigott and Lady Clare Smyth-Pigott—a daughter.

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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. *Front Cover & Back Cover*
Armstrong Siddeley Motors, Ltd. ... ... 125
Arrol-Johnston, Ltd. ... ... ... *Front Cover*
Auster, Ltd. ... ... ... ... ... *Front Cover*
Beardmore Aero Engines, Ltd., The *Front Cover*
Bowden Brake Co., Ltd., The ... ... ... 148
Bristol Aeroplane Co., Ltd. ... ... ... 141
British Thomson-Houston Co., Ltd., The ... 130
Calthrop, E. R., Aerial Pat., Ltd. ... ... 147
Cellon, Ltd. ... ... ... ... ... ... 147
Cunard Line ... ... ... ... ... ... 148
Davis Furnace Co., The ... ... ... ... 147
De Havilland Aircraft Co., Ltd., The... ... 130
Fairey Aviation Co., Ltd., The ... ... ... 129
Handley Page, Ltd. ... ... ... ... 125
Kodak, Ltd. ... ... ... ... ... ... 137
McGregor, Gow, & Holland, Ltd. ... ... 147
Metal Airscrew Co., Ltd ... ... .. *Front Cover*
Napier, D., & Son, Ltd. ... ... ... ... 135
New Pegamoid, Ltd. ... ... ... ... 148
Nieuport and General Aircraft Co., Ltd. ... 137
Roe, A. V., & Co., Ltd. ... ... ... ... 126
"Shell" Marketing Co. ... ... ... ... 133
Short Bros., Ltd. ... ... ... ... *Back Cover*
Titanine, Ltd. *Front Cover & Inside Back Cover*
Vickers, Ltd.... ... ... ... ... 139
Westland Aircraft Works... ... *Inside Front Cover*

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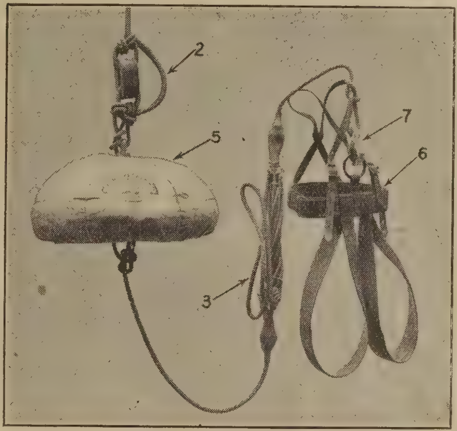

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## ON THINGS THAT ARE HAPPENING.—I.

### Mr. Churchill's Departure.

The departure of Mr. Winston Spencer Churchill from the Air Ministry is another blow to British Aviation. Mr. Churchill has his faults, he has cultivated the acquisition of enemies as sedulously as one has oneself, and he has made mistakes—on the good old principle that the man who never makes mistakes never makes anything else. But he is certainly the best friend British Aviation has ever had.

It was Mr. Churchill who, with the possible exception of Mr. Balfour, was the first of all men of Cabinet rank to appreciate the importance of aircraft and to realise that the quaint apparatus on which some of us used to risk our necks in 1909 or thereabouts would in the end bring that portentous thing which is now known to politicians and publicists as Air Power. And having realised that he set to work to build up the Royal Naval Air Service at a time when the Navy regarded those intelligent young officers who then believed in the future of aviation as rather unamiable lunatics.

The R.N.A.S., thanks to Captain (later Commodore) Murray Sueter, R.N., backed by Mr. Churchill, developed various new and experimental aeroplanes and engines, while the R.F.C., under General Henderson, was trying, twenty years too soon, to standardise its aeroplanes and engines as the Artillery had standardised its guns. Their Lordships of the Admiralty kicked vigorously against expenditure on aeroplanes, but Mr. Churchill had his way and Commodore Sueter got what he wanted. The result was that at the outbreak of war the R.N.A.S. had kept the Aircraft Industry alive and had new ideas in aeroplanes and engines coming along which, when the R.F.C. found itself outclassed by the German aeroplanes, saved the situation in the air and indirectly on the ground.

Furthermore it was Captain Sueter and the late Lieut. Hyde-Thompson, again backed by Mr. Churchill, who developed the torpedo-dropping seaplane, a weapon which was abandoned when Mr. Churchill left the Admiralty and Commodore Sueter was displaced by less intelligent successors. And to-day the torpedo-aeroplane is upsetting and confusing the calculations of all the Navies of the World.

Mr. Churchill did considerably more than merely back Commodore Sueter, for he himself flew in all the various types of land machines and water machines used by the R.N.A.S.—except the single-seaters—and took a personal interest in the design and equipment of the machines and in the types of engines. One knows, from conversations at the time, that in the later stages of the war Mr. Churchill knew a great deal more about the practical and technical side of Naval aviation than did the majority of the senior Naval officers who were at various times inflicted on the R.N.A.S. by the Admiralty.

Also, Mr. Churchill is the only Cabinet Minister who can pilot an aeroplane himself. He is quite a good pilot—so long as he is not too close to the ground. His landings, one believes, are apt to be a trifle erratic.

Since the war, as Air Minister, Mr. Churchill has done much for the R.A.F. Without his influence it would have been far worse treated by the Treasury than it has been. And without him in his dual capacity as War and Air Ministers the R.A.F. would not have been entrusted with so much military responsibility as it has had. Certainly it would not have had command of the Somaliland affair, the most successful of all our small wars since we ceased to fight Germany. His successor will find it hard to do as much to push forward to such an extent the claims of the R.A.F. to be considered a first-class fighting Service instead of merely an accessory to the two Senior Services.

The only consolation to the aeronautical community about Mr. Churchill's move is that as Secretary of State for the Colonies he will have opportunities of encouraging the development of aviation in precisely those parts of the British Empire where there are the greatest opportunities for aerial transport. It may be taken as certain that he will not lose any chances which offer of helping forward the progress of aviation.

Many of us who realise the debt of gratitude which all aeronautical people owe to Mr. Churchill hope to see him before long in a higher position than he holds to-day. Hitherto, like others with great ambitions, Mr. Churchill has been hampered by poverty. When a man's political schemes are influenced by the need of holding down his job for the sake of his bread and butter he can never give play to his ideas. In other words, he is forced to be a politician rather than a statesman. At the same time, he has on occasion sacrificed his job to his principles. Which is very greatly to his credit. In much the same way no editor of a newspaper can be truly outspoken and honest so long as his style is cramped by being compelled to avoid offending his advertisers.

It is understood that Mr. Churchill has recently inherited at any rate a modest competence through the lamented death of Lord Herbert Vane-Tempest in that absolutely avoidable accident on the Cambrian Railway. One hopes that as a result Mr. Churchill will be able to devote his whole immense energy and brain-power in future to pure and applied Statesmanship.

His chief difficulty politically is that he has no personal following in Parliament. There is no Churchill Party in the House. That difficulty may be overcome now that he can devote to securing a following such time and energy as he has hitherto had to expend on making a living. He has the personal charm and the mental power of a leader of men. All that is needed is the will and the time to use those qualities.

Given a party to back him in the House there is no reason why Mr. Churchill, who is now only forty-six years of age, should not be Premier during the Great Slav War in fifteen or twenty years' time, or at any rate War Minister—over the Sea, Land, and Air Forces—in a Labour Government ten years hence. If or when he holds either of those positions it will be a very good thing for aviation.

Meantime aviation and all concerned therewith owe Mr. Churchill a deep debt of gratitude for all that he has already done for aircraft. And so we all wish him well whatever may be his occupation in the future.

[NOTE.—At the time of going to press Mr. Churchill had not relinquished his appointment as Secretary of State for Air, though he had left the War Office to become Secretary of State for the Colonies. The future of the Air Ministry is enveloped in mystery, but it is unlikely that Mr. Churchill will continue to control the Air Ministry from the Colonial Office. The two departments are entirely dissimilar in character.

The leader has therefore not been modified, and it can be accepted as intelligent anticipation in conformity with a habit not uncommon with the Editor of this news-sheet—who is happily too far away at the moment to protest against this comment.—W. E. DE B W.]

### The State of British Aviation.

The state of British Aviation at the moment reminds one of that aged story of the old nigger woman and the beautiful mulatto girl. The said girl was parading down the street of her "home town," as they call it in the States, dressed in purple and fine linen, when an old nigger mammy who knew her as a child hailed her with, "Lawd's sakes! Chloe, w'ar yo' get all dem fine clo'es?" "What, A'nt Dinah!" replied Chloe, "ain't yo' he'ered? I'se rewined!"

Somehow British Aviation seems like that. It is gorgeously housed in a beautiful Ministry. It has beautiful parks in the form of aerodromes equipped with vast sheds and wireless stations and Customs officers. It has hosts of servants, in the way of Controllers and Deputy Controllers and Civil Air Traffic Officers and all their subordinates. And it is decorated, as with a necklace, by a £60,000 subsidy. But all the same it is ruined.

What is going to be done about it? Who is going to take this poor fallen thing and make it respectable again, especially now that its chief protector has gone off to a new Colonial residence? All the high and mighty politicians who once professed their affection for aviation have turned their backs on it. All the motor-mongering fraternity and other tradespeople who made fortunes out of it when aviation was flourishing turn up their noses with scorn if one talks aviation to them—though, with poetic justice, most of them are fairly well broke themselves.

Probably in the end, like the erring heroine in melodrama, aviation will be taken to the bosom of the honest, hardworking Englishman and will become a useful help-meet to the common business-man. And then aviation will have to work for its living, instead of being flattered and advertised as it was during the war and for a year afterwards. Which will be remarkably good for it.

In plain language, and forsaking all this poetic imagery, what British Aviation needs is a few sound business men to take air transport in hand and run it as a business concern. Nobody has even made a recognisable attempt at doing so hitherto. The difficulty is to get the real business man to take any interest in any proposition to run an air line.

The business man's view is so narrowed by attention to his own business that he cannot see how by co-operating with other business men and organising an air line he can accelerate communication to the benefit of all their businesses. Evidently some greater inducement must be offered to him.

One is told that such an inducement is on offer if the bait can be put in front of the right fish. Quite outside any communication from the Air Ministry, either direct or indirect, one hears that those in high places (much higher than the Air Ministry) are gravely perturbed at the state of aviation, and are in consequence prepared to offer a title or titles of sorts to one or more people of reputable antecedents who will start doing air line work on an adequately large scale. Perhaps a title will tempt where mere improvement of business will not. Also a title may attract an individual rich man whereas it would be very difficult to persuade several less rich men to co-operate.

Co-operation is not an Anglo-Saxon virtue. The Teutonic tribes are individualists and only co-operate when kicked into co-operation by a superior being, as the Saxons were kicked into discipline by the Normans and as the Germans were kicked into an Empire by the Prussians. And as our English shopkeepers are still purely Saxon, except for the predatory Welsh drapers, one cannot expect them to co-operate in building a big air line scheme.

It is only the Celts who are good co-operators, and only then because co-operation is a form of conspiracy. That is why co-operative societies flourish in Ireland—and have their premises burnt by "Black-and-Tans" to prevent the mere Irish from growing rich, as has been the custom for seven hundred years.

Because the Celts do co-operate we may find the necessary co-operation to form a strong air line in Scotland, or even in Lancashire where also the people are still Celtic and where the co-operative societies and trade union conspiracies flourish in consequence. But it is still more likely that a title will catch the necessary capital and business experience for the organisation of one or more air lines.

## Foreign Competition.

Meantime one hopes that foreign competition will act as a spur to the lethargic Englishman. We have all heard that the Koninklijke Luchtvaart Maatschapij is to run regularly between Amsterdam, Rotterdam, and London in the Spring, and that it will extend in other directions to Scandinavia and Germany. Mr. Plesman, the Director of the line, is one of the most enthusiastic believers in aviation, and one of the keenest business men one has met. He has the backing of some of the best banking and shipping firms in the Netherlands, and a highly influential board of directors. In fact the K.L.M. has all the elements of success.

And anything that this paper can do to help that success will be done, for if our own so-called business men will not provide us with air lines, then in the interests of aeronautical progress we must help foreign lines. Already the K.L.M. is doing more for British aviation than is any British firm, for it is buying British engines (Siddeley "Pumas") in its Fokker machines, and it is engaging experienced British pilots (late of the let-down A.T. and T., Ltd.) to fly them.

What one would like to see would be a British firm registered by the K.L.M., equipped with British machines and pilots, so as to be duly qualified, and drawing a British subsidy for doing it. Then perhaps at last our commercial community would awake to the reality of the situation—and its humour.

Some two hundred and fifty years ago a Dutch Fleet sailed up the Thames, fired shots at Greenwich, looted the farms on the banks, and went away with the booty unmolested. Probably one's spiritual, if not one's physical, ancestors rejoiced very much at that performance, for the shock awoke the contemporary and contemplative Englishman to the need for a Navy, and in due course he got it. Certainly one would be very pleased to see Mr. Plesman and the K.L.M. come over here and loot our £60,000 subsidy if as a result we could be made to wake up and insist on having a Royal Mail Air Line of our own.

## The Matter of Germany.

It would be still more amusing if a German air line, with German machines and German engines were to start running direct from Berlin to London. And probably the result would be the more beneficial because the shock would be greater. Such a salutary lesson might well be given, but for a new piece of foolishness in the dealings of the Allied Governments' Council with our late enemies.

Whether the said Council is acting on its own initiative or on the advice of that intensely comic affair the Inter-Allied Aeronautical Commission one does not pretend to know, but in any case the result is the same. Just because Germany has been too busy reconstructing her damaged industries (instead of fooling with her business the way we have been doing in this country) to spare time and men to hand over a lot of aeroplanes and engines for the Allies' scrap-heap, the Allies have decided that "no manufacture or import of aeronautical material shall take place" till three months after some ridiculous condition or other has been fulfilled to the satisfaction of some quaint Inter-Allied officials or other.

That is to say, the German Aircraft Industry which has already since the war made substantial progress in the design of genuine commercial aircraft, to the benefit of the world at large, is to be stopped from making anything at all. And incidentally is to be stopped from making and selling aircraft to help to pay for the War Indemnity for which all the Allies are screaming and are so unlikely to get. It is all as unstatesmanlike and as idiotic as England's handling of Ireland to-day.

English and French papers are howling that if Germany is allowed to build big commercial aeroplanes they can be turned in a few minutes into bombing machines, and that if Germany is allowed to build a big commercial air fleet she will be in a position to bomb Paris and London without notice. Such arrant nonsense is worthy of the papers which print it. A bombing fleet of commercial machines without adequate escort of fighting machines would be as helpless as a fleet of Atlantic liners against a fleet of battle-cruisers. One only wishes that such air raids on London were possible. They might shake the somnolent or ignorant Englishman into a realisation of the fact that we have no commercial air fleet at all.

Hundreds of thousands of pounds' worth of those excellent and reliable German aero engines are being broken up as scrap metal, which is a sheer wicked waste of the only real Capital in the World, namely the produce of Labour. If those engines were presented gratis to the German aeroplane firms then Germany, impoverished as she is, could afford to build commercial aeroplanes to fit them. And the results would be that Germany could afford to run a number of well-equipped air lines, by means of which commercial correspondence and samples of goods could be conveyed quickly and cheaply to all surrounding nations. Thus the re-opening of trade, the re-establishment of Germany's wealth, and the payment of her war debts would be greatly accelerated.

Meanwhile, stopping the manufacture of German aircraft is helping to ruin the British Aircraft Industry. The more the Germans develop their aeroplanes the more we shall develop ours. Nothing makes the Englishman move except competition. France has made no progress in aeroplane design since 1916 or 1917. America has made no progress since the Wrights' machine of 1908, for every American machine since then has only been a poor copy of a European machine—and, as in the cases of the Bristols, de Havillands and Handley Pages for which the drawings were sent to the United States without reward or fee or royalty to the original designers, sometimes a very distinct disimprovement.

Only Germany and England have made any real progress in aviation since the war, and now, as already indicated, British Aviation is ruined—at any rate for the time being. Obviously then the world's aeronautical progress for the immediate future depends on Germany. And all that progress is to be stopped because a few brass-bound and hide-bound officials do not happen to be satisfied with the German's way of handing over aircraft material. Assuredly it is time that the official people of the Allied nations displayed a little more plain sense.—C. G. G.

# THE THAMES AS AN AERODROME.

It is believed by many that London's Real Aerodrome is the River Thames, and not one or other of sundry large fields from 6 to 10 miles outside London.

"Why drive miles through heavy traffic when London's Aerodrome is by nature more central than any of London's railway termini?" That is the question asked by some of the most enlightened people concerned with aviation.

"Because the traffic on the River Thames is too thick, and the river is too narrow to make it a safe place for the alighting or departure of seaplanes." That is the reply of the people who do not know what has already been done.

## BUT IS IT?

For the last two years of the war almost all Fairey Seaplanes delivered to the Royal Naval Air Service and the Royal Air Force were sent by road from the firm's works at Hayes, Middlesex, to the nearest point on the Thames at Islesworth, where the river is quite narrow, and were flown off the river, down which they flew, right through London, to the air stations on the Coast.

Not one of those machines ever had an accident, nor did any of them damage any of the ordinary river traffic. That was the first regular use of the River Thames as an aerodrome. And it was used under the most difficult conditions.

## AFTER THE ARMISTICE.

When hostilities ceased and all businesses began to boom, an enterprising newspaper desired quicker deliveries to readers at the holiday resorts in the Isle of Thanet during the summer of 1919 than could be given by rail or road.

Consequently a Fairey Seaplane was engaged to carry copies of that paper daily to Margate. And the service was maintained very satisfactorily so long as the newspaper required it. And this time the machine started from Blackfriars Bridge, in the middle of London.

Again, all this flying was done from London's most central aerodrome without accident and without hindrance to traffic.

## PIONEERING AGAIN.

Once more, as may be seen, the Fairey Company has done pioneer work, which has shown what can be done with a seaplane, when that seaplane is of the highest class, and is properly handled by a competent pilot and competent engineers.

After these experiences, and in the belief that rivers of comparatively small size will be used all over the World for aerodromes—because most cities are built along rivers—the Fairey Company proceeded with the design and construction of Amphibian Aeroplanes with floats, instead of fitting wheels to a flying-boat. For the firm has, during the war, done useful pioneer work in experiments with Amphibians.

## AND NOW.

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## THE ROYAL AERO CLUB AND SPORT.

One learns that the Royal Aero Club has eight sporting events in which they are interested for 1921.

First comes the Monaco Seaplane Meeting in April The time before this is rather short but it is hoped that there will be at least one British competitor.

Following that comes the Inter-Varsity Meeting at Hendon in the last week in June. The R.Ae.C. are providing the machines for this race and the competitors will be members of Cambridge or Oxford Universities. It will probably consist of team races across country, etc., and be run on lines similar to the Inter-Varsity Sports.

Then follows the Royal Air Force Tournament or what last year was called a pageant. This will probably take place in the first week in July.

The Aerial Derby will come towards the end of July and it is rumoured that among other machines there is to be a racing "Bristol."

It was originally intended to hold a seaplane circuit of Britain, but this was found to entail expenses which would not be justified at the present time, and so it is intended to hold a seaplane race at Cowes probably during Cowes Week For this race a fast Supermarine is rumoured to be in the offing.

At the end of September the Royal Aero Club are making a determined effort to recapture the Schneider Cup at Venice. Three competitors will be selected and the Club are putting up £1,000 to cover competitors' expenses. Arrangements are being made to cut down expenses by "pooling" mechanics for the race.

It is hoped to send three competitors to Brussels for the Gordon Bennett balloon race

There is also to be a circuit of 3,000 km for the British Michelin Trophy. In France the course can just be mapped out by making the turns in the extreme corners of the country. In England, however, owing to faulty geographical design, the course will be about one and a half up and down the country. The prize, which is essentially for commercial type machines, is open for competition until the last day of the current year.

Hendon has not yet been definitely selected as the venue for the three British land events, and it would seem to be best, now that Hendon has ceased to be of any aerial importance, to hold these events at Croydon. The advantages of the latter from the point of view of the public have already been noted, and it would afford a good opportunity, by holding the events there, of teaching the public the existence of the premier air port and so help poor old Civil Aviation along.

Enclosures could be provided at quite a small cost—in fact these will probably be in existence by then, anyhow; and doubtless the Trust House would be able to do the catering. At any rate Croydon deserves and requires the attendance of the public more than that departed glory that was Hendon.

For details and further particulars see R.Ae.C. Notices on p. 169.—G. D.

## THE MONACO MEETING.

For the benefit of any likely British competitors at the forthcoming Monaco Seaplane Meeting the following particulars concerning the accommodation supplied by a French correspondent are published.

In addition to the usual accommodation at St. Raphael the Monaco Meeting organisers have erected on the quay at Monaco one hangar of 14 metres and six of 12 metres width. There will be a crane for hoisting machines onto the quay, so that hoisting rings are necessary.

No trolleys are being provided for handling the boats on the quay, and competitors are expected to provide their own. This is important, as one Italian machine last year was damaged through trying to use a hurriedly made trolley which did not support the boat properly.

Further detailed information may be obtained from Mr. Eric Neal, 39a, Boulevard des Capucines, Paris, up to the end of March, and afterwards from Mr. Bruhnés, c/o Organisateurs du Meeting d'Aviation, Monaco.

## THE THAMES AS AN AIR PORT.

In an official communiqué issued by the Controller of Information, Department of Civil Aviation, Air Ministry, on the above subject the reasons for the appearance of the Napier-engined Vickers "Viking III" are set out.

It is pointed out that the original experiments and demonstrations were made at Southampton by the Supermarine Aviation Works, Ltd.

After the Air Ministry competitions at Martlesham, the Air Ministry, as contemplated by the terms of the competition, bought "Viking III," and so, very naturally, having by now a most excellent machine of their very own, decided to use this for further tests.

It is understood that the next demonstration by "Viking III" will be a series of consecutive tests.

Some perturbation was caused by the fact that the order permitting these alighting tests was signed by Lord Milner instead of the Secretary of State for Air. The reason of this is that such an order must be signed by a Secretary of State of some kind, and Lord Milner was the only one of the breed available at the time.—C. D.

## THE MALTA-SYRACUSE MAIL CONTRACT.

The mail service between Malta and Syracuse, Sicily, for which fresh tenders had been invited, has been secured by a London shipping firm. The subsidy amounts to £10,500 per annum, the service to run five days per week. It is believed that this contract is quite short, so that it seems to offer a very good opportunity to a British firm to run an air line for mails and passengers between these two points when the contract is again put up. There are excellent facilities at either end for both seaplanes and land machines.

# NAVAL AND MILITARY AERONAUTICS.

## GREAT BRITAIN.

### The King's Levees.

The following extracts directly concerning the Royal Air Force are reprinted from the Lord Chamberlain's announcement concerning the Royal Levées to be held at St. James's Palace on Tuesday, March 1st, at 11.30 a.m., and on Monday, March 7th, at 11.30 a.m.

Dress.—Royal Air Force.—Officers in possession of full dress uniform, full dress; officers not in possession of full dress uniform, Service dress.

Para. 5.—All officers of the Royal Air Force of whatever rank, whether on the active or retired lists, will communicate with and obtain their cards through the usual channel.

### The Vulnerability of the Capital Ship.

The ex-German battleship *Baden,* after having been in dockyard hands for some months, was recently towed to Spithead between the Dean Tail and Elbow Buoys, and there submitted to 40 rounds of short-range firing in the presence of a number of gunnery experts. Torpedo officers also carried out experiments, the tests including aërial attacks.

As a result of the rather brutal treatment the *Baden* was sunk, but it is believed that she will be raised for a further series of experiments.

The tests, which were secret, will doubtless reveal many interesting details, in that it is the first time that a modern battleship has been thus tested to destruction.

### The Trials of R.80.

The Vickers-built R.80 underwent a six-hours' speed trial on Feb. 9th from Walney. Owing to a heavy fog the departure could not be made until the afternoon. She was clear of her shed in two minutes and an hour later left the ground under the command of Capt Little. Her speed was not ascertainable, but it is expected that she at least equalled her designed speed of 75 m.p.h

It is reported that when her trials are through she will go to America with an American crew.

### Aeroplane Burnt in Ireland.

On Feb. 10th, at 16.00 hours, an R.A.F. aeroplane made a forced landing at Ballinamina, near Kilfinane, Co. Limerick. The pilot, named Moreton, went for assistance, leaving his observer, named Mackey, with the machine. During his absence a number of armed men attacked the machine and when the pilot returned the observer was missing and the machine in flames.

### 20 and 24 Squadrons, R.A.F., Annual Dinner.

On Feb. 12th, at the Holborn Restaurant, 20 and 24 Squadrons held their annual dinner. About thirty officers serving or lately serving in the two Squadrons were present. Squadron-Leader E. H. Johnson, O.B.E., was in the chair, and among those present were Flight Lieut. T. C. Hazell, D.S.O., M.C., D.F.C., Flight Lieut. O. H. D. Vickers and Flight Lieut. Saundby. There were few speeches and the evening ended with joy to everyone.

### No. 9 Squadron (R.N.A.S.) Reunion Dinner.

A Reunion Dinner for all officers and other ranks who served with No. 9 (R.N.A.S.) or 209 (R.A.F.) Squadron, will be held on March 5th at a rendezvous to be announced later. Will all those who desire to be present communicate with the Hon. Secretary, Mr. A. H. Middlemiss, 74, Devonshire Road, Hackney, E.9.

### Fencing.

R.A.F. v. Oxford University.

A match between R.A.F. and Oxford University was held at the R.A.F. School of Physical Training and Drill, Uxbridge, on Saturday, Feb. 5th, and resulted in a win for the R.A.F. by 18 matches to 8 after some closely contested bouts.

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# CURIOSITIES OF THE U.S. ARMY SERVICE.—II.

The functions of the Army Air Service and of the Navy Air Service are outlined briefly in the Report. The policy governing these functions has been approved by the Secretary of War and by the Secretary of the Navy.

Aircraft are divided into three categories :—Army, Navy, and Marine.

### Army Aircraft

The first category—that of Army aircraft—are concerned with (i) operations from the coast as a part of the Army; (ii) the defence against enemy aircraft of shore stations; (iii) operations alone or in co-operation with the Navy and other units of the Army against attacking enemy ships.

### Navy Aircraft.

Navy aircraft, manned by Naval personnel—form the second category. They operate from mobile floating bases or from Naval stations ashore. They are considered as "an arm of the fleet." Their duties include oversea reconnaissance, attack on shore defences and establishments from ships or alone—provided the occasion is purely Naval—the protection of coastal sea communications by patrol and reconnaissance, convoy work, the destruction of enemy vessels, surface or submarine, and attack on enemy vessels engaging coast positions. In this latter function they may be working in conjunction with the Army.

### Marine Aircraft.

The third category consists of "Marine aircraft" (these in Great Britain would be Naval) provided by the Navy Department and manned by Marine Corps personnel. These machines are employed, on occasions when the Army is not represented, on work normally performed by the Army. In cases where Marine and Army aircraft are engaged in the same land operations "the control of their operations will be governed by the one hundred and twentieth article of war."

### Co-ordination and the Joint Board.

That confusion may be avoided an additional number of clauses are included in the written policy defining in detail the methods to be adopted on general questions by those controlling each category of aircraft.

There is, it should be stated, a Joint Aeronautical Board composed of Naval, Military, and Civil personnel. Questions affecting co-ordination of effort are submitted to this Board and recommendations are then made by the Board to the Secretaries of War and of the Navy. Thus strategical and tactical questions affecting the seaboard areas are referred to the joint body. New projects or designs for the construction of aircraft, the selection of sites for and erection of new air stations, the formation of experimental stations, questions of common use by both Services and other problems of a similar nature come within the terms of reference.

In matters of design or construction new aircraft and new weapons will be developed by one or other of the Services, but not by both simultaneously. The one not charged with this development may obtain and use aircraft or weapons produced and made efficient by the other Service. The Aeronautical Board decides which Service shall construct any new aircraft.

Information in regard to experiments is exchanged constantly between the two Services.

Training and other facilities of either Service will be made available when possible for each Service.

One clause is delightful and played slowly should be an excellent game. "Before arranging to purchase aircraft each Service will attempt to secure aircraft of the type desired from or through the other Service." Literally this implies that should both Services require the Kentucky Kinkajou monoplane each would with due solemnity order it through the other Service. By this means the proper delay in the delivery of machines may be increased at will.

Financial estimates for both Services are submitted to the Board for the revision before Congress is asked to consider them.

### War Expansion and Reserves.

The greatest problem affecting all military forces is that of expansion in time of war. No race can afford to maintain in peace an army, or even a navy, adequate for its needs in a first-class war. On the other hand, if preparation be neglected until war threatens disaster is brought within measurable distance, as initial success in hostilities is of vital importance. In addition, the expenditure is increased to an enormous degree.

Nations whose situation in a military sense has made possible a permanent system of conscription are able to maintain an inexpensive though large and efficient reserve. Under the voluntary system no reserve can exist unless sufficient attractions, mental and visual, are given to possible recruits.

### Materiel Reserves.

A second difficulty, less to some degree than that of procuring trained personnel, is the arranging of expansion in matériel.

In regard to the war expansion in matériel the Report says it "must depend upon the whole manufacturing resources of the nation; in fact, must depend upon resources not yet established and must lay its plans to the end that such resources shall be established and maintained. The Army must spend its appropriations in experimentation, in limited procurement, and in the test, under field conditions, of experimental productions, in order that it may know what equipment to use when war comes." If this intention—to casual appearance wise—be carried out logically the U.S. Army Air Service will be relatively ineffective as a striking force when war comes to teach the United States that there are higher things in life than New York buildings. Experimentation should never be permitted to affect in any way the maintenance of adequate matériel for the existing Air Service

### Personnel Reserves.

In regard to personnel General Menoher realises the high importance of training large numbers of efficient reserve officers. For "other ranks" he relies upon the enlisted reserve and upon "the mechanics engaged in civilian and commercial aeronautics and in aircraft manufactories—sources that are to-day so small as to be almost negligible."

### The National Guard

The National Guard is what in England we should class as a second reserve. Its personnel would presumably be used for drafting purposes to first-line units. In response to the request of the Chief of the Militia Bureau regulations have been drawn up for the organisation and training of sixteen National Guard air units to be formed under an authorisation of the War Department.

Each will "consist of one observation squadron, one balloon company and one photo section."

### The Training of National Guard Personnel.

The Air Service do not consider decentralised training—i.e., at home stations of the units—either to be economical or safe, and the original draft regulations provided for primary training at an Air Service School, where alone can be provided constant medical examination and the necessary strict discipline.

As this primary training would entail a continuous stay of four months of an Air Service School the Militia Authorities were of opinion that National Guard officers could not spare the necessary time. In consequence the regulations were altered to permit of ground training and of primary flying training (through dual control stages) to be given at the home stations in cases where the local unit has on its strength enough fully trained pilots and observers to undertake this instruction. The final advanced training will then be given at Air Service Schools.

### Equipment.

Training equipment for these units will be supplied from the large reserve stores still in the possession of the U.S. Army. In accordance with the desire of the Chief of the Militia Bureau the service equipment of the National Guard units is to be similar to that of the regular squadrons and in consequence a "further appropriation" must be obtained from Congress.

The National Defence Act will require alteration in the National Guard section in order to permit of the maintenance on duty at all times of a maximum of five enlisted men for each National Guard unit. These men are required for the care of the matériel allotted for use.—W. E. de B. W.

*(To be continued.)*

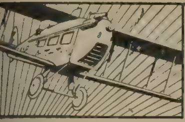
## A LITTLE KNOWLEDGE, ETC.

An "expert" writing in a well-known London evening news-sheet on the Breguet-Bugatti biplane compares this machine with what he calls the Siemens-"Schubert" biplane, as regards engine arrangements. This in the first place is wrong, as it is the Linke-Hoffmann biplane that embodies the same engine principles, the Siemens-Schuckert having four airscrews—two tractor and two pusher—driven from a central engine-room. The difference between the Breguet-Bugatti and the Linke-Hoffmann is that the former has two twin Bugatti engines on central bearers with space all round, whereas the latter has four separate Basse-Selvé engines arranged two on either side of the engine-room

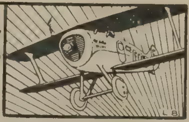
The writer has presumably a better knowledge of classical music than he has of aeronautics, hence the pardonable error with the second of the twin names.

## MORTGAGES, CHARGES & SATISFACTIONS.

Navarro-Wellesley Aviation, Ltd.—Satisfaction to the extent of £1,250 of mortgage dated Sept. 13th, 1920, securing £10,000 (notified Feb. 3rd, 1921).



# COMMERCIAL AERONAUTICS
## AND CIVIL AERIAL TRANSPORT.



## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G. E. A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

**FEBRUARY 7th:**

S.N.E.T.A., DH4, O-BABI, Brussels-London, 13.55-12.40/8th, G.&M., Nil, Briere.

**FEBRUARY 8th:**

G.E.A., "Goliath," F-GEAC, London-Paris, 12.21-15.00, G.&M., Nil, Patin & 1.

M.A., Spad, F-CMAW, Paris-London, 13.00-15.18, G.&M., Nil, Le Sec.

M.A., Breguet, F-CMAF, Paris-London, 13.15-15.55, G., 1, Challoux.

S.N.E.T.A., DH4, O-BARI, Brussels-London, 13.05-15.49, G.&M., Nil, Delzenne.

**FEBRUARY 9th:**

G.E.A., "Goliath," F-GEAD, Paris-London, 13.05-13.35/10th, G.&M., 2, Labouchere & 1.

**FEBRUARY 10th:**

M.A., Breguet, F-CMAF, London-Paris, 13.02-15.43, G., 1, Challoux.

M.A., Breguet, F-CMAW, London-Paris, 13.05-15.30, Nil, Nil, Le Sec.

S.N.E.T.A., DH4, O-BABI, London-Brussels, 13.27—, Nil, Nil, Briere.

S.N.E.T.A., DH4, O-BARI, London-Brussels, 13.27-16.25, Nil, Nil, Delzenne

**FEBRUARY 11th:**

G.E.A., "Goliath," F-GEAD, London-Paris, 12.47-15.30, G., 1, Labouchere & 1.

S.N.E.T.A., DH9, O-BELG, Brussels-London, 12.35-11.32/12th, G.&M., Nil, Wouters.

**FEBRUARY 12th:**

NIL.

**FEBRUARY 13th:**

M.A., Breguet, F-CMAH, Paris-London, 10.15-15.33, G., Nil, Challoux.

### The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

**FEBRUARY 7th:**

NIL.

**FEBRUARY 8th:**

H.P.T., DH9, G-EATA, London-Paris, 12.15-14.45, G.&M., 1, ——.

**FEBRUARY 9th:**

H.P.T., DH9, G-EAUI, London-Paris, 12.30-15.15, Nil, 2, ——.

**FEBRUARY 10th:**

H.P.T., O/400, G-EATN, London-Paris, 12.15-15.40, G.&M., 7, ——

H.P.T., DH9, G-EAUI, Paris-London, 12.35-15.45, M., 2, ——

H.P.T., DH9, G-EATA, Paris-London, 14.00-16.35, Nil, 1, ——

**FEBRUARY 11th:**

H.P.T., DH9, G-EATA, Brussels-London, 12.22-14.42, G.&M., Nil, ——

H.P.T., DH9, G-EAUI, London-Paris, 1407-16.25, G.&M., 2, ——

H.P.T., O/400, G-EATM, Paris-London, 12.35-16.20, C.&M., 5, ——

H.P.T., DH9, G-EATA, London-Brussels, 12.35-15.03, Nil, Nil, ——

**FEBRUARY 12th:**

NIL.

**FEBRUARY 13th:**

NIL

### Air Port Statistics.
CONTINENTAL

| | | | |
|---|---|---|---|
| MACHINES: | | | |
| | Croydon 13 | Cricklewood 9 | Total 22 |
| PERSONNEL.—Passengers: | | | |
| | Croydon 5 | Cricklewood 20 | Total 25 |
| Crews: | | | |
| | Croydon 16 | Cricklewood 11 | Total 27 |
| | | Total Personnel | 52 |

### Inland Flying at Croydon.

Feb. 7th.—Nil.

Feb. 8th.—L.A.S., Avro and DH6 to Leatherhead (Muir and Knowles). M.W.T.C., DH6, Wireless tests (Lovell).

Feb. 9th.—I.A.L., "Vimy," joy-ride (Barnard).

Feb. 10th.—M.W.T.C., DH6, Wireless test (Lovell).

Feb. 11th.—Nil.

Feb. 12th.—L.A.S., Avro Leatherhead return and joy-riding (Muir); I.A.L., "Vimy," joy-riding (Muir).

Feb. 13th.—L.A.S., Avro and DH6, Leatherhead return and joy-riding (Muir and Knowles); I.A.L., "Vimy," joy-riding (Barnard).

### The London Terminal Aerodrome.

Mr. Barnard on the "Vimy" was out during the week and on Saturday and Sunday was carrying many passengers. Unfortunately the "Bat" was not quite ready, but is expected to be out early this week. There is every possibility of the D.H.4a being ready again soon as the engine is to be tested during the week. The machine itself is at Northolt and will return to Croydon as soon as the engine is ready.

Mr. Muir and Mr. Chapman arrived from Leatherhead on the Avro and Mr. Muir carried several passengers. On Sunday they were over again and the second pilot, Mr. R. T. Knowles, came over on the "6."

M. Bouderie (who says he is not M. Boudré) is kept very busy. There is a rumour to the effect that there is to be a further French subsidy of 20 francs a rubber.—G. D.

### A London—Birmingham Service.

On Feb. 21st the Instone Air Line start a service to Birmingham in connection with the British Industries Fair to be held at Castle Bromwich. The "Vimy" and the "Bat" will be used, and the fare will be £3 15s. single and £7 return.

As this fair is to be held actually on Castle Bromwich Aerodrome, travelling by air will save hours, as if passengers go by train they will have the long drag out to the aerodrome from Birmingham.—G. D.

### The Emancipation of Royal Air Force Aerodromes.

In Air Ministry Notice to Airmen No. 16, dated Feb. 11th, 1921, it is announced that the aerodromes in List B occupied by the Royal Air Force, hitherto to be used by civil aircraft in emergency only, may now also be used (a) for refuelling in the course of journeys where no civil facilities exist, (b) for landing of passengers proceeding to a destination near the aerodrome concerned.

One believes that all along this has been allowed unofficially, but the official emancipation of these aerodromes for civil use is very satisfactory to all concerned.

### Parachute Demonstration at Cambridge.

On Feb. 10th Major T. Orde-Lees, A.F.C., made a parachute jump from a height of 800 ft. at Girton, Cambridge, before the University Aeronautical Society.

The machine from which Major Orde-Lees jumped was a D.H.9 piloted by Lieut. Ortweiler, M.C.

(*Continued on page 168.*)

PASSENGER FLIGHTS AT
CROYDON AERODROME—10/-
RING UP: PURLEY 1180. (EXTENSION 14.)
FLIGHT, INCLUDING
CHARABANC FROM LONDON
AND RETURN — 17/6.
INSTONE AIR LINE.

THE

# D.H.18

*"The most economical transport aeroplane yet in existence."*
*—Technical Press.*

SPECIFICATION AND PERFORMANCE.

**Engine—**
450 H.P. Napier "Lion."

**Main Dimensions—**

| | |
|---|---|
| Span | 50 ft. 6 ins. |
| Chord | 6 ft. 6 ins. |
| Overall Length | 38 ft. 10 ins. |
| Overall Height | 13 ft. 0 ins. |

**Capacity—**
8 passengers or 2,200 lbs. of freight in 255.75 cub. ft.
1 Pilot (NOTE—Cubic capacity for heavy loads only — 200 cub. ft.)
105 Gallons Petrol,
10 Gallons Oil.

**Weights—**

| | With 8 Passengers. | With Freight |
|---|---|---|
| Machine empty with water | 4,040 lbs. | 3,880 lbs. |
| Crew | 180 lbs. | 180 lbs. |
| Useful Load | 1,440 lbs. | 2,200 lbs. |
| Petrol | 761 lbs. | 761 lbs. |
| Oil | 95 lbs. | 95 lbs. |
| Total Weight Fully Loaded | 6,516 lbs. | 7,116 lbs. |

**Loading—**

| | |
|---|---|
| W/HP. (with 6,516 lbs.) | 13.1 lbs. |
| W/HP. (with 7,116 lbs.) | 14.2 lbs. |
| Lbs./sq. ft. (with 6,516 lbs.) | 10.5 |
| Lbs./sq. ft. (with 7,116 lbs.) | 11.5 |

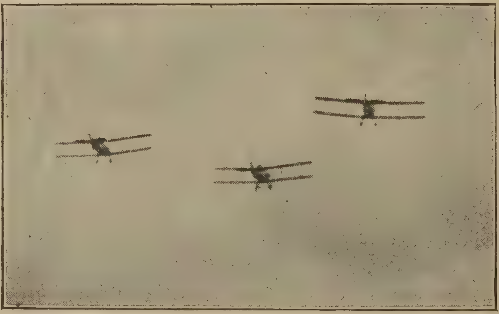
**Total Area of Main Planes—**
618 square feet.

**Performance—**

| | With 8 Passengers. | With 2,200 lbs. Freight. |
|---|---|---|
| Speed at 1,000 ft. | 128 M.P.H. | 124 M.P.H. |
| Speed at 5,000 ft. | 125 M.P.H. | 121 M.P.H. |
| Climb to 10,000 ft. | 20 mins. | 25 mins. |
| Ceiling | 16,000 ft. | 15,000 ft. |
| Endurance (full speed at 5,000 ft.) | 3.3 hours (413 miles) | 3.3 hours (400 miles) |

ONE MACHINE FOR IMMEDIATE DELIVERY.

**THE DE HAVILLAND AIRCRAFT Cº. LTD. STAG LANE AERODROME, EDGWARE, MIDDLESEX.**



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Business and Pleasure
Comfort and Economy
Reliability and Sound Service

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are in the forefront

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AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

NCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

The final report of the Advisory Committee for Aero-autics, which has now ceased to exist, is briefly reviewed elow. In its past life this body has done much good ork which has been somewhat discounted by the unfor-unate attitude assumed by some of its members towards hose who, if they knew less of science, knew considerably ore about practical aeronautics than did the Committee. here are signs that this attitude was in process of modi-cation—may that modification be accelerated under the uspices of the Advisory Committee's successor.

The Breguet "Leviathan"—an interesting example of the central engine-room type of aeroplane—is described and illustrated in this issue. This machine is designed around the Breguet-Buggatti power plant which was shown at the Paris Aero Show at the end of 1919.

A series of comparative sketches and an explanatory note give particulars of some of the many and varied radiator arrangements used on German aircraft during the War.

## THE FINAL REPORT OF THE NATIONAL ADVISORY COMMITTEE.

The report of the Advisory Committee for Aeronautics for 919-20 which has just been published marks the close of the areer of that body, which has now ceased to exist under that tyle and title. The functions which have been discharged y the Advisory Committee since 1909 now pass to the Aero-aptical Research Committee, which is not merely the old ody under a new name, but has additional duties and powers.

The report gives but a brief summary of the work carried ut under the auspices of the Committee, but it suffices to ndicate that at the end of its life the Committee had acquired n attitude of slightly less satisfaction with its own exclusive ossession of aeronautical knowledge.

The work of Dr. Prandtl, of the Göttingen Laboratory, in volving a general theory of the mutual interference of the ings of a multiplane and the effects of aspect ratio is recog-ised, and the report of the Committee in its reference to ie tests made on the Voyewodski models and to the Handley age wing (which incidentally is not named) involve an bandonment of the previous dogma that there is no wing hich can under any circumstance give better results than .A.F.15.

The grace of this retiral is somewhat marred by the para-raph in the supplement which appears to disparage the Fokker thick wing in comparison to the R.A.F.19 section, despite the fact that on N.P.L. figures R.A.F.19 would be a very bad wing for any practicable aeroplane, whereas the Fokker wing in practice is used on a machine of somewhat remarkable qualities.

The report shows that the new 7 ft by 14 ft. wind-channel at Teddington has been still further delayed and that experimental work on large models at high speeds has suffered accordingly. The work on the determination of "scale effects" has therefore been confined to full-size experiments at the R.A.E., a fact which in no wise detracts from the practical value of the results. Dealing with scale effects on airships the report admits that the range between wind-tunnel tests and the actual ship in flight is too wide for the accurate prediction of results from the model tests alone

The experiments made to determine the cause of the accidents to the Tarrant triplane and to the Felixstowe "Fury" are mentioned, and in the first instance the conclusion that switching on the upper engines when taxi-ing would suffice to turn the machine over on its nose unless their moment was counteracted by controls, despite the fact that the machine would have been satisfactorily stable in flight, is a useful confirmation of the opinion generally arrived at from the general design of the machine.

THE AIR PORT OF WESTMINSTER.—The Vickers Viking III (450-h.p. Napier engine) alighting on the Thames above Westminster Bridge. This, the first demonstration of the ability of amphibian machines to bring aerial traffic to the centre of London, should be of immense educational value.

Progress in the reduction of stability calculations to a form suitable for practical design purposes is reported from the R.A.E., and experimental stability determinations on models of large machines have been continued

The work of the R.A.E. on the development of air-cooled cylinders and on engines with fuel injection is mentioned, together with tests of magnetos and experiments destined to improve the design of these accessories.

Among many other subjects which have come within the scope of the Committee in its last year of existence have been those of load factors for civilian aircraft, precautions against the outbreak of fire, tests of models of aircraft-carrier ships with a view to securing steady air flow over the deck, the protection of kite-balloons from atmospheric electrical discharges, tests of light alloys and special steels, tank tests of loads on seaplane hulls when alighting, and on the stability of such hulls on the water, tests of fabric and dope, and the investigation of accidents.

Taking into account the very wide extent of its field of activity it would have been surprising if the Advisory Committee had, in its 11 years of work, given no occasion for adverse criticism. Such criticism as it has been necessary to make has been largely due to the attitude adopted by certain departments working under that Committee, and there are signs that these departments are now beginning to realise how much they still do not know.

So one may feel that the Committee of Aeronautical Research which now exists may be expected to carry on all the good works with a somewhat better appreciation of its own limitations.

## THE BREGUET "LEVIATHAN."

The French firm of Breguet have for some time past been engaged upon the production of a machine designed around the Breguet-Buggatti 800-h.p. power plant which was exhibited at the Paris Salon of December, 1919-January, 1920. The machine is now in a fairly advanced stage of production, and some details of it are available.

It will be remembered that the power plant in question consists essentially of two Buggatti engines, each of 400 h.p. The Buggatti engine in its original form consisted of two rows, each of 8 vertical cylinders, arranged above a common crankcase, each row driving an independent crankshaft. Pinions on the end of each crankshaft geared into a gear on a common airscrew shaft, so that each set of 16 cylinders, though really two engines, operated as one unit.

To form of two such units a Breguet-Buggati plant one of the units is turned end for end, and its crankcase is dropped, so that the centre line of the common gear into which the pinions of all four crankshafts can now engage lies above the level of the crankshaft of the reversed engine. The crankcase of this unit is provided with a third row of bearings, centrally above those of the crankshafts, to support a through airscrew shaft.

Instead of the pinions at the end of each crankshaft being fixed to that crankshaft they are arranged to have a slight longitudinal travel, and they are held out, and in engagement with the gear on the aircrew shaft, by a spring, which is aided by the thrust on the pinions themselves—which are of the spiral type—when the pinions are actually driving. If the engine ceases to drive, the thrust on the pinions reverses and overcomes that due to the spring, and the pinion slides back along the crankshaft.

This movement is made to declutch the crankshaft involved from the remaining part of the plant, and also to close the throttle of that line of cylinders.

On running that line of cylinders up to speed a reversed action occurs as the engine tends to overrun its fellows, and clutches it in again.

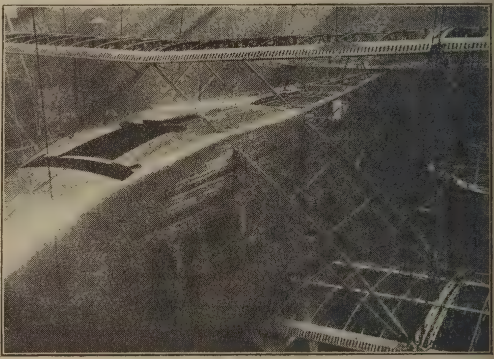
No details are available as to the type of clutches used, or of the means employed to ensure that the four crankshafts are clutched together in their correct angular relation.

The cylinders composing these units are cast in blocks of four, each is of 110 mm. bore by 160 mm. stroke, each has three valves, two inlet and one exhaust, 34.5 and 50.5 mm. respectively in diameter.

The machine destined for the reception of this power plant is a biplane of all-metal construction, wood entering into the construction only of the airscrew and a few minor fittings in the fuselage.

The fuselage is built on four duralumin tube longerons, braced by stamped duralumin frames without cross wires. The seats for the pilots are well aft in the fuselage, and the space intervening between power plant and pilot forms a cabin available for either passengers or goods. Bombs are also considered as a possible load.

The wing cellule is built up, with pressed duralumin ribs, duralumin tube spars, and duralumin interplane struts of profiled section. Bracing of steel cable is used in the bays. All strut and cable fittings are of the ball and socket type, to avoid imposing on the structure moments caused by faulty erection. The upper wing has a dihedral, the lower wing is flat, and both wings are slightly swept back.



**View showing central Wing Struts and the Wing Construction.**

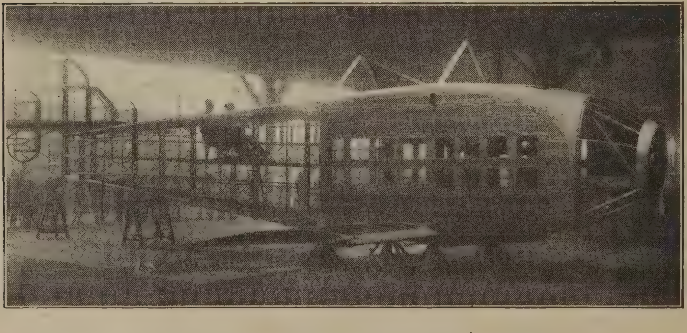
Four fuel tanks arranged to be dropped if necessary in the event of fire are to be fitted, these tanks having a capacity sufficient for seven hours' full power flight.

If the machine is equipped for bombing purposes, six machine-guns form the defensive armament, two arranged to fire forward, two aft above the tail, and two fitted to fire aft below the tail.

It is claimed that the machine, despite ample structural strength, will be very light. The figures given for weights shows that the structure weight gives a very low percentage of the total loaded weight, and the ratio between the weight of the machine bare and the disposable load of fuel and cargo, 1.38 to 1, is abnormally high for so large a machine.

Specification of the "Leviathan" Breguet, Type XX.

| | |
|---|---|
| Span | 25.538 m. |
| Total length | 14.016 m. |
| Gap | 3.665 m. |
| Total height | 5.135 m. |
| Upper wing area | 74 sq. m. |
| Lower wing area | 66 sq. m. |
| Total wing area | 140 sq. m. |
| Area of tail plane | 7.150 sq. m. |
| Area of elevator | 8.250 sq. m. |
| Area of fin | 1.190 sq. m. |
| Area of rudder | 2 sq. m. |
| Area of side fins | 1.440 sq. m. |
| Weights— | |
| Structure | 1,000 kg. |
| Power plant | 1,600 kg. |
| Empty machine | 2,600 kg. |
| Fuel | 1,500 kg. |
| Useful load | 2,200 kg. |
| Total | 6,320 kg. |
| Load per sq. m. | 45.100 kg. |
| Load per h.p. | 7.430 kg. |
| Performance— | |
| Maximum speed | 190 km.p.h. |
| Minimum speed | 90 km.p.h. |
| Speed at 2,000 m. | 175 km.p.h. |
| Cruising speed | 160 km.p.h. |
| Ceiling (estimated) | 4,500 m. |
| Climb to 2,000 m. | 20 min. |
| Range (cruising) | 1,600 km. |
| Duration (cruising) | 10 hr. |



**The Fuselage of "Leviathan" partially erected.**

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AERO ENGINES

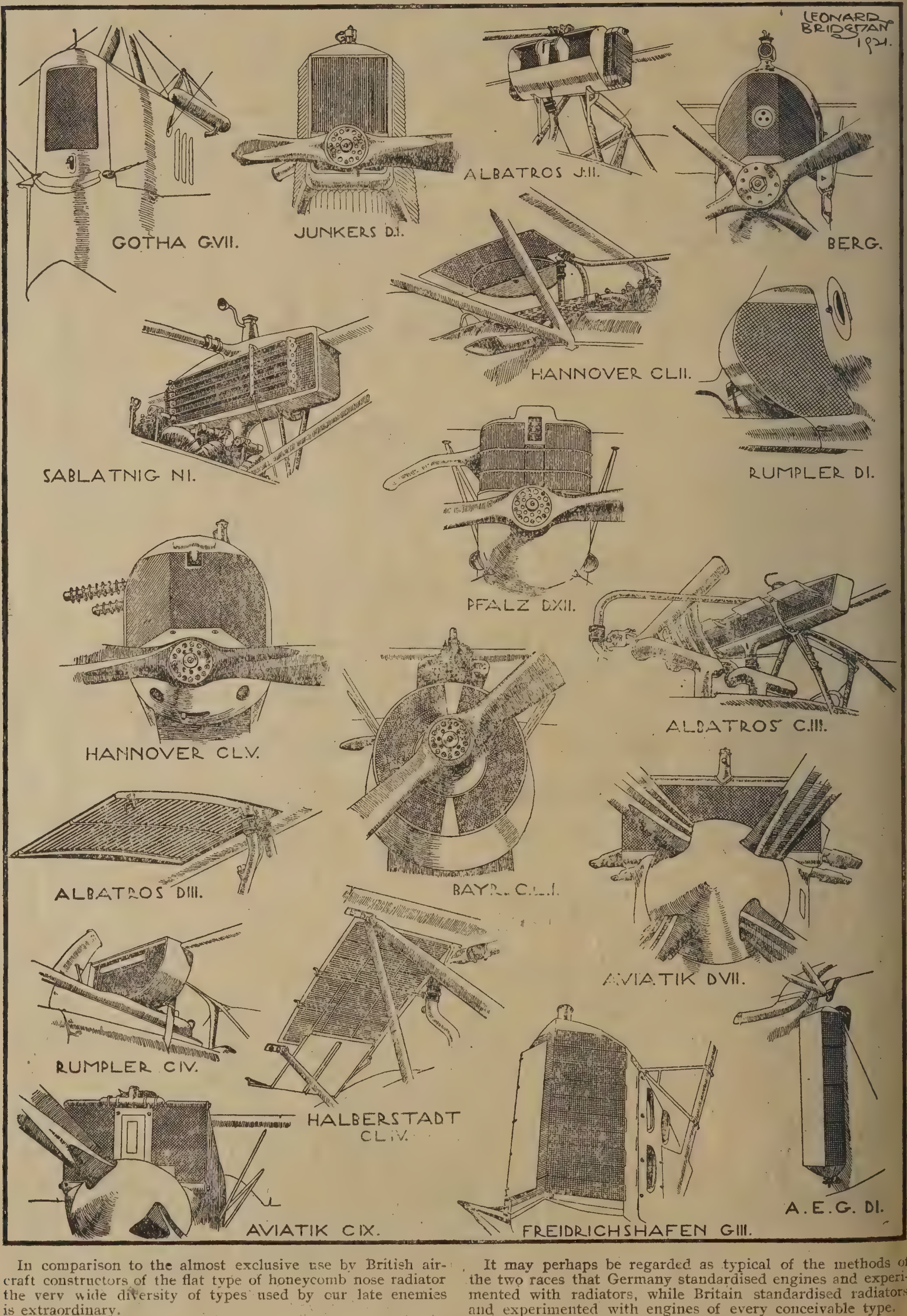
"THEIR EXTREMELY FINE PERFORMANCE IN THE WAR PLACED THEM IN THE FRONT RANK, AND IT IS AS CERTAIN TO-DAY THAT A MACHINE WITH A ROLLS-ROYCE ENGINE IS ACCEPTED AS POSSESSING THE MAXIMUM POSSIBLE FACTOR OF RELIABILITY."

*Aircraft Engineering July, 1920.*

ROLLS-ROYCE, Ltd., 15, Conduit St., London. W.1

Telegrams: Rolhead, Reg, London. Telephone: Gerrard 1654 (3 lines)

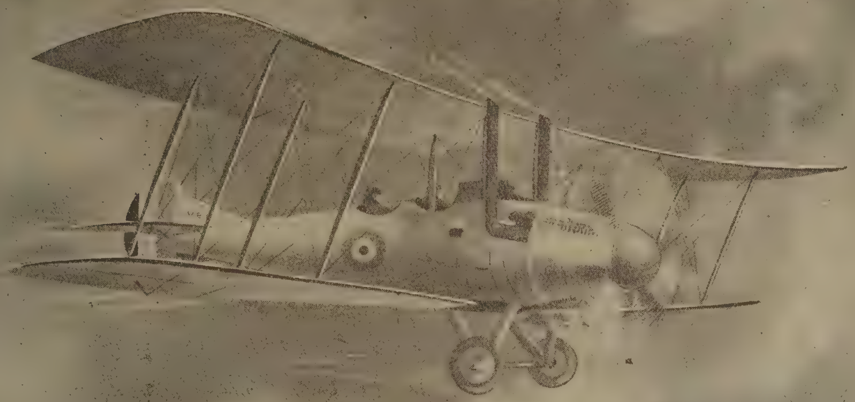
## TYPICAL GERMAN RADIATOR PRACTICE.



In comparison to the almost exclusive use by British aircraft constructors of the flat type of honeycomb nose radiator the very wide diversity of types used by our late enemies is extraordinary.

It may perhaps be regarded as typical of the methods of the two races that Germany standardised engines and experimented with radiators, while Britain standardised radiators and experimented with engines of every conceivable type.

BEARDMORE



*Passenger, Postal, Goods Carriage*

*Their reliability in war is your surest guarantee of their dependability under peace conditions.*

WILLIAM
BEARDMORE
AND COMPANY, LIMITED.

*Naval Construction Works,*
DALMUIR.

*Aerodrome & Hangars at Dalmuir and Inchinnan.*

THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS S·B·A·C

AEROPLANES

The sketches reproduced here show a number of typical enemy radiator arrangements, including the radiator shutter devices used.

Starting from the top and proceeding from left to right, the first sketch represents a flat-nose radiator installed in the nacelle of a twin-engined Gotha bomber fitted with pusher airscrews. The Junkers radiator which follows is an example of a flat tube radiator used in the nose of a tractor machine.

The radiator of the J.11 Albatros is mounted at the leading edge of the upper wing and shows the segmental construction due to Herr Windhoff. The sections outside the central blocks are removable and are carried on long bolts which are concentric with the water-connections of upper and lower water spaces. Sections can be removed or replaced by undoing two nuts, and tight connections between the segments are made by simply screwing up the nuts. Suitably formed washers under the nuts seal the end connections of the outer sections.

The nose radiator of the Berg Scout—an Austrian product—is of honeycomb type and apparently an effort has been made to give to the radiator some semblance of a streamline entry. This arrangement is of very doubtful value. Probably the increase in the resistance of the radiator tubes themselves is greater than any improvement in the general body resistance attained. The interesting feature here is really to be found in the little block of radiator tubes just below the filter cap. This is obviously intended to condense water vapour rising from the header tank and so to permit an average water temperature which would otherwise result in large evaporation losses.

The radiator of the Sablatnig N.1 is another example of the leading-edge position and shows a radiator shutter arrangement very similar to British standard practice. It is noticeable that in no case are German shutters arranged to blank off the whole of the radiator face, as was frequent in British practice. A curious feature of this radiator is the forward facing bell-mouth on the vent pipe. Some idea of increasing the static pressure within the radiator by use of the velocity head due to air speed seems to have dictated this. Such an increase would raise the boiling point of water, but the effect can at best have been negligible.

The radiator inset into the centre section of the Hannover C.L.11 shows yet another curious position favoured by German designers. The semicircular sheet metal shutter which can be rotated to blank off part of the surface is remarkably simple, and being within reach of the pilot calls for no operating mechanism.

The radiators of the Rumpler D.1 are noticeable only for their curious shape and their position, protruding from the side of the oval sectioned fuselage just above the front spars of the lower wing.

The nose radiator of the Hannover C.L.V. resembles somewhat that of the Berg. The inlet pipe to the upper water space is brought into that tank from below, a space being left in the radiator block for the purpose. This, combined with the domed top of the tank, probably secures a very uniform circulation across the radiator block.

The air-cooled exhaust pipes of this machine are curious.

The Pfalz D.XIII radiator has a similar inlet arrangement, but the radiator itself is of the vertical tube type with circular tubes.

The radiator fitted to the Albatros C.III resembles in type and position that of the Sablatnig N.1. The curious balanced radiator shutter is notable.

The Albatros D.III radiator occupies a position in the centre section similar to that of the radiator fitted to the Hannover C.L.11, but the radiator itself is of tubes set transversely to the air current. This suggests a high radiator resistance, but may possibly also give a high cooling rate for a given tube area.

The circular radiator of the C.L. type machine built by the Bayerische Flugzeugwerke is built up in annular segments more or less of honeycomb type. Wedge-shaped water tanks are fitted at top and bottom and the circulation passes round the segments on each side from top to bottom.

The Aviatik D.VII radiator is a compromise between the nose and the centre section positions It probably combines the effective cooling of the nose type due to its presence in the slipstream with less evil effects on resistance than either type.

The Rumpler C.IV radiator is another centre-section leading-edge type. The adaptation of the domestic roller blind as a radiator shutter is interesting.

The Halberstadt radiator, sunk into the centre section, shows again how simple a shutter arrangement is possible when the shutter is within reach of the pilot's hand. In this case a sheet-metal plate is slid up or down in two guides to blank out part of the cooling surface

The Aviatik C.IX of the bottom left-hand corner is of generally similar type to that used on the same firm's D.VII, but the radiator is in two sections, run in parallel, with a panel between, removable for access to the engine front.

The Friedrichshafen G.III gives another example of a nose radiator fitted on a pusher nacelle. The single shutter on one side only of the radiator is curious.

Finally, the A.E.G. D.1 shows a simple side radiator of honeycomb construction which recalls in its position that adopted by the designers of certain early British seaplanes.

## THE MONACO MEETING, 1921.

The following is a précis of the regulations concerning the hydro-aeroplane contests at the Monaco Meeting for 1921 organised by the International Sporting Club of Monaco under the competition rules of the Aero Club de France and the regulations of the F.A.I. which take place from April 13th to 20th.

The first contest to take place on April 15th-16th is a race from Monaco—Ajaccio—Monaco, the object being to ensure the postal service between the South of France and Corsica (as alleged last year when the trans-Mediterranean race was a frost.—Ed.).

For this purpose each competitor must pick up the mail at Monaco and deliver it at Ajaccio, where he must pick up the Corsican mail and deliver it to Monaco. Each competitor must carry a useful load of at least 200 kilogs. aid if required fly the course at a minimum height of 2,000 metres.

The prizes for this contest are: 1st, 40,000 francs; 2nd, 12,000 francs; and 3rd, 8,000 francs.

Before taking part in the contest each competitor must carry out the following preliminary tests in the Bay of Monaco. He must climb to 2,000 metres in not less than 45 min., carrying 200 kilos. of ballast, supplies, apparatus and regulation instruments. The weight of any passenger carried in addition to the usual crew may be deducted from the total weight of ballast. All machines must be provided with a wireless sending set of 500 watts. During the test competitors must send a call by means of their wireless. During the whole of the contest Monaco—Ajaccio—Monaco competitors must carry the ballast, crew, supplies, apparatus, instruments, and wireless set, as laid down for the preliminary test.

On April 19th a competition for speed and weight-carrying machines will take place over the circuit Monaco—Cannes—San Remo—Monaco, to be flown twice, a distance of 286 km.

The start will be in line on the water in the Bay of Monaco. Weight-carrying machines must carry 200 kilogs. of ballast and be provided with a wireless sending set of 500 watts. The weight of any passenger carried in addition to the usual crew may be deducted from the total weight in ballast. Competitors will start with supplies, tools, apparatus and regulation instruments. Speed and weight-carrying machines may not take part in this contest unless at the time of starting they have attained a height of at least 3,000 metres in less than an hour in the former and 2,000 metres in 45 min. in the latter category. These tests must be carried out at least two hours before the time of starting in the contest

The prizes for both the speed and weight-carrying contests will be: 1st prize, 12,000 francs; 2nd prize, 8,000 francs. An entry fee of 100 francs, which is not returnable, must accompany the entry forms for these two contests.

On April 17th and 20th there will be two speed contests, one on each of the days specified. The start will be made in line in the Bay of Monaco, the turning points Cannes, Monaco, Mentone being passed in flight, and the arrival will be in flight in the Bay of Monaco. The course is about 125 km.

The prizes for each contest will be: 1st prize, 6,000 francs; 2nd prize, 2,500 francs; and 3rd prize, 1,500 francs.

Each day between 11 a.m. and mid-day competitors who have given notice the day before may attempt to establish the greatest speed over a nautical mile for hydro-aeroplanes. This contest will be open from April 13th to 20th, and a prize of 3,000 francs will be awarded to the holder of the greatest speed at the end of the meeting. A sum of 5,000 francs divided into eight prizes of 625 francs will also be awarded to the pilots who establish the best performance each day from April 13th to 20th.

A height contest will be held under similar conditions with a prize of 3,000 francs for the pilot who has reached the greatest height during the meeting and eight prizes of 625 francs, one for each day of the meeting, for the best daily performance.

In addition to the above contest various tests of skill have been arranged, consisting of:

(1) Alighting, from a certain height with engine off, in an area indicated by four buoys, the winner to be the pilot whose machine stops definitely nearest the centre of the area. The prizes will be: 1st, 800 francs; 2nd, 400 francs; 3rd, 300 francs.

(2) Destroying balloons. For each machine three balloons will be released at intervals of 30 sec. Each machine must

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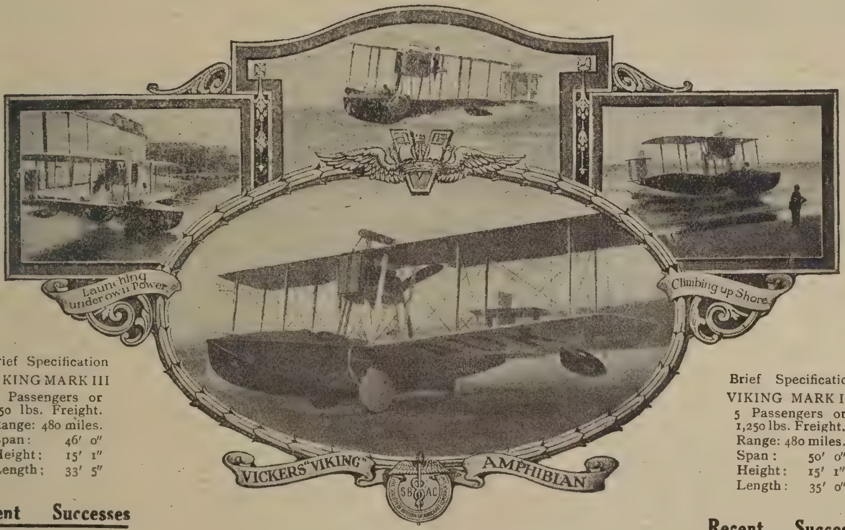

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Length: 35′ 0″

Recent Successes

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

1. Shortest time in "unsticking" from water.
2. Fastest time over a given circuit.
3. Climb to 1,000 metres.
4. Altitude with full load.

Recent Successes

The Vickers Viking was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION September, 1920

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BRISTOL—55, Park Street. BELFAST—26a, Arthur Street.
LEEDS—Greek Street Chambers, Park Row.
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VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

carry a passenger, who will endeavour to destroy the balloons with a gun within 10 mins. The prizes will be: 1st, 500 francs; 2nd, 300 francs; 3rd, 200 francs.

With a view to assisting the competitors as far as possible towards the expense of transporting their machines a guarantee of 5,000 francs at the end of the meeting will be given for each machine entered which has arrived in proper time and completed at least 100 km. in one of the contests.

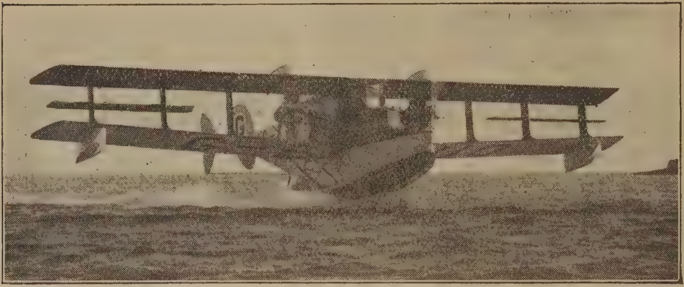
This guarantee will, however, only be given where a prize has not been won or if the total of prizes won does not reach 5,000 francs. In the latter case the amount will be increased in order to bring it up to the figure of the guarantee—namely, 5,000 francs.

This guarantee will only be given in the case of machines which have arrived from a distance of 500 km. or more.

Entry forms for all the above contests may be obtained from the Royal Aero Club, 3, Clifford Street, London, W.1.

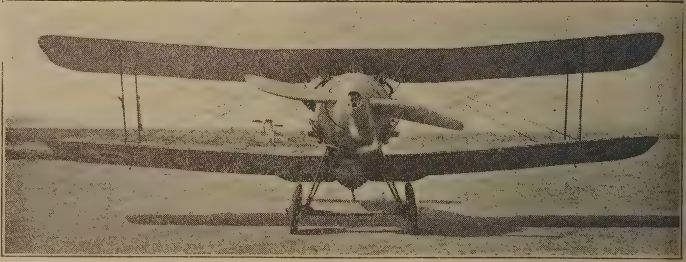
All entry forms, accompanied by their respective entry fees, are received up to midnight, Feb. 28th, either at the International Sporting Club of Monaco, 10, rue Auber, Paris, or the Aero Club de France, 35, François Ier, Paris.

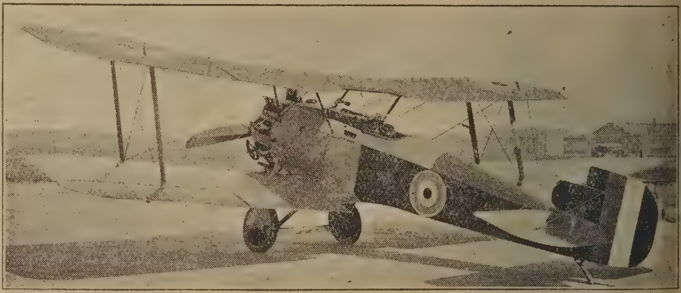
## SOME INTERESTING MACHINES.

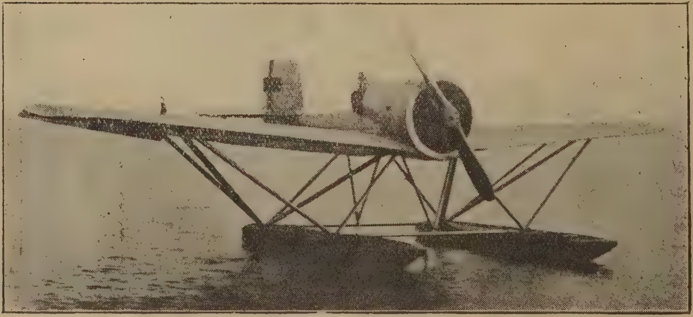


**THE SAUNDERS "KITTIWAKE."—Just leaving the water. Mr. F. Merriam at the controls. It will be remembered that the "Kittiwake" was not finished in time for the Air Ministry Competition for Amphibians. Work on the machine has been continued, various minor improvements have been incorporated which could not possibly have been completed in the rush of building for the Competition, and she has now passed very successful flying trials at Cowes.**

**THE SOPWITH "SNAPPER."—This photograph, together with that below, shows two views of a single-seater fighter designed and built by the Sopwith firm at the last stages of the war. For permission to reproduce these photographs and the data hereafter given "The Aeroplane" is indebted to the Directorate of Supply and Research, the Air Ministry. Fitted with the A.B.C. "Dragonfly" of 320 h.p., the "Snapper" bears a marked resemblance to the original Sopwith "Pup" in general design. Carrying pilot, twin synchronised guns, 40 gall. of fuel and 4 gall. of oil, the machine weighed 2,190 lb., or 6.85 lb. per h.p. With this load the speed at 3,000 ft. was 140, at 10,000 ft. 138, and at 17,000 126, m.p.h. The service ceiling was 23,100 ft. and the climb to 16,800 ft. took 17 min. 10 sec.**







**A GERMAN SHIPPLANE.—Th curious little float seaplane here illus trated was one of the last war product of the L.F.G. (Roland) Works at Stral sund. It was designed particularly t be carried on relatively small ships, pro bably of the commerce raiding class and was to be used for reconnaissance The rigid wing bracing permits th rapid erection of wings without an trueing-up process, as the machine ha to be stowed below decks on a ship no designed as an aircraft-carrier.**

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AEROPLANES

## FROM AMERICA.

### The Development of Torpedo Aircraft.

Rear-Admiral Bradley A. Fiske, of the United States Navy, is one of those people afflicted by inventive ideas. According to a writer in the *Scientific American*, the idea of a two-piece cuff-link occurred to him long ago, but he did not work out the details and it remained for a later inventor to make use of the idea.

Also he was seized by the basic idea underlying the modern system of fire control—worked out in detail by Sir Percy Scott and generally used by all the great navies of to-day—and took out a patent covering the idea.

Further, he patented an automatic pencil which had a happy knack of continually breaking its leads, and in 1912 he took out a patent covering the use of torpedo-carrying aeroplanes for use as a weapon of war.

This fact is used by the writer in the *Scientific American* to claim that the work done in this country and presumably in Germany in perfecting torpedo-planes was inspired by Admiral Fiske's invention, and that he is to be regarded as the inventor of the torpedo-plane.

Now the facts are that in 1912 there did not exist any aeroplane capable of flying with a torpedo on board, and that lacking such an aeroplane Admiral Fiske's "invention" was of as great utility as were Mr. Wells' many inventions of a much earlier date—such as his tanks or his invention of war in the air generally.

Also, before such aircraft existed Lt. H. D. Hyde-Thompson, R.N., Naval Wing, R.F.C., with the connivance of Capt. Murray Sueter, R.N., Director of Air Services at the Admiralty had carried out practical trials of torpedo release gear for use on seaplanes.

These tests were made from a seaplane on the water, not in the air, and the result was that as soon as a seaplane capable of lifting a torpedo was available the Naval Wing, R.F.C.—shortly afterwards to become the R.N.A.S.—was in gears for use on seaplanes.

At the outbreak of war one R.N.A.S. station alone possessed six such machines ready for action, and that they failed to produce any effect on enemy forces was due to the fact that these forces did not venture to within the limited range of aircraft of those days.

So far as can be discovered, neither Admiral Fiske nor any other American contributed in the very least to this development into a practical weapon of an idea within the brain-power of any writer of fiction till after the outbreak of the Armistice.

## AN OMISSION REPAIRED.

A recent article on the construction of rigid airships in the *Scientific American* is illustrated by a page of photographs showing various such ships in various states of erection in the works of the builders. It is of interest to observe that all the ships illustrated are recognisably British and that the majority of the photographs are from the Vickers Works at Barrow.

As the *Scientific American* is in the fortunate position of being able to adhere to the rule of never mentioning a mere manufacturer by name in its editorial pages this fact might escape notice, particularly as nothing indicates even the country of origin of these photographs.

## TRADE NOTES.

### Lloyd's Aviation Record.

Lloyd's have now issued a Record Book of all Aircraft Pilots who hold British Civil Aviation Pilots' Licences.

The book is similar in form to the Aircraft Record Book which has already made its appearance. A separate page in the book is devoted to the particulars of each pilot. Details are given of the pilot's name, address, date of birth, licence type, etc., dates between which it is valid, a record of general flying experience, accidents, date of last medical examination, and the types of aircraft for which he is licensed to fly.

The Pilots' Record Book may be inspected by any person interested, on application to the Secretary of Lloyd's Aviation Record, Lloyd's, Royal Exchange, London, E.C.3.

### The First British All-Metal Machine.

The Short "Silver Streak" which was exhibited at the last Olympia Aero Show has been purchased by the Air Ministry and was flown by the makers' pilot to Farnborough during last week. An average speed of 125 m.p.h. was maintained on the delivery trip.

The "Silver Streak" is the first all-metal aeroplane of British construction which has flown successfully—and it has a number of hours in the air to its credit.

It is understood that no further flying is to take place upon this machine, it being the intention to submit it to detailed tests to destruction of the strength of the structure. Considering the very great care taken by the makers in making tests of trial sections of the various forms of structure used there can be little room for doubt that the machine will give satisfactory results on the official strength tests.

It is greatly to be hoped that at the conclusion of these tests an order for a duplicate machine for flying tests will be given to Short Bros.

### The Origin of the "Cub."

It is of interest to learn that the Napier "Cub" was designed in the South of France under the supervision of Mr. Montague S. Napier (chairman of the firm), who for reasons of health has to reside in that part. Mr. A. J. Rowledge and some of the drawing office staff spent some time in France in connection with this important work.

### The Management of the Palmer Tyre Co.

It is announced that Mr. G. A. Parsons has been appointed general manager of the Palmer Tyre Ltd. succeeding Mr. E. J. Mitchell in that position.

Mr. Parsons has been a member of the Palmer staff since January, 1904, when he was appointed manager of the motor tyre department, and he has been responsible for the control of the sales of Palmer cord tyres from their conception until the present time.

He was appointed joint general manager of the firm in May, 1919. Also under his control has been the department handling Palmer aeroplane tyres and wheels.

When it is remembered that every aeroplane built for the British Air Forces in this country during the war was fitted with Palmer wheels and Palmer tyres, and that despite the sudden and enormous increase in the production of aircraft during that time, not only was there never any delay in supply of these important fittings, but there was always a margin of supplies available for our Allies, it will be realised that Mr. Parsons has given definite proofs that he possesses a degree of organising ability which may be held to amount to genius.

**Mr. G. A. Parsons, General Manager, the Palmer Tyre Ltd.**

All who have dealt with Palmer goods in the past will join in congratulating the Palmer Tyre Ltd on their choice of a new managerial chief and Mr. Parsons on his well-deserved succession to this important position.

### Rolls-Royce Engines.

The following letter has been received :—

Sir,—In view of the publicity given in your paper to the misstatement that the 1,000-h.p. Napier aero-engine was to be used in the "Titania" flying-boat in place of the 600-h.p. Rolls-Royce aero-engines, I enclose a copy of letter from the Air Ministry.

Although of course it would not be surprising if the Air Ministry decided to use the considerably larger and more powerful Napier engines for certain purposes for which they may have been specially designed, yet I feel sure you will wish to give prominence to the fact that Rolls-Royce engines will be used in the "Titania" and sister boats as originally designed for flying long distances—viz., up to 1,500 miles.—(Signed) For Rolls-Royce, Ltd., B. Johnson (General Manager).

Air Ministry, Kingsway, W.C.2.,
Feb. 4th, 1921.

Gentlemen,—With reference to your letter of Feb. 4th regarding the statement made by the —— and other papers that two Napier "Cub" engines are being fitted in the "Titania" flying-boat in place of four Rolls-Royce 'Condor" engines, I am directed to say that the "Titania" and sister boats are to be fitted, as originally designed, with "Condor" engines.—I am, Gentlemen, your obedient servant,

(Signed) C. P. Robertson
(For Controller of Information).

### A Change of Title.

The very ingenious navigating instrument designed by M. Yves Le Prieur, and described in this journal (Jan. 26th) under the style of the "Dérivographe"—literally "Driftograph"—has now been re-christened by its designer as the "Navigraphe."

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# CIVIL AVIATION—SEASON 1921.

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(*Continued from page 155.*)

### Brooklands.

At the Brooklands works of Vickers Ltd. a commercial "Vimy" has been re-designed and modified for ambulance work. The interior of the fuselage has been fitted up with stretchers and appliances for the conveyance of injured people. The engine mountings have been altered to accommodate two 450-h p. Napier "Lion" engines, which are placed more forward and lower than is usual in the "Vimy." The new machine should be on test when these notes appear. —J. F. S.

[It is understood that this machine has been built to the order of the Royal Air Force.—Ed.]

### Woking.

There is a possibility that the recently formed Handasyde Aircraft Company may establish premises at Brooklands or Woking. There are many people in Woking who have rosy visions of the new firm ultimately absorbing a large number of the local unemployed, as the existence of the company has been disclosed in local papers.

Numbers of their employees are being re-engaged by Martinsyde, Ltd., and one has heard unconfirmed rumours of the firm having a small aircraft contract. Many changes have taken place among the moving spirits of the firm, the former secretary, Mr. F. H. Campkin, having left, together with certain other officials.—J. F. S.

# THE BRITISH DOMINIONS BEYOND THE SEAS.

## CANADA.

### Police Capture an "Aerial" Criminal.

A typical American yarn has been worked round the capture of an alleged confidence man, who has been wanted in Iowa, U.S.A., for obtaining £3,600 on a promise to build an aeroplane factory! It is stated that he fled on an aeroplane, but detectives following him (it did not say how) obtained the co-operation of the Canadian Mounted Police who met the aeroplane as it crossed the border, and opened fire with machine-guns.

The battle (rather one-sided, one imagines) was kept up until bullets from the police punctured the petrol tank and damaged the airscrew of the fugitive machine so that he was forced to land.

### A Long Commercial Flight.

On Oct. 15th, 1920, a three-seater Avro biplane (110-h.p. le Rhone) G-CABV, belonging to the Canadian Aircraft Co., Ltd., of Winnipeg, piloted by Messrs. H. Dougall and F. H. Ellis, and carrying Mr. F. J. Stanley as passenger, flew from Winnipeg, via Gladstone, Dauphin, Swan River and Hudson's Bay Junction to The Pas, a distance of 487 miles.

This flight is claimed to be the longest commercial trip yet undertaken and accomplished in Canada, and the Avro G-CABV is the first machine to fly N. of 53 degrees in Saskatchewan, Manitoba and Ontario. The whole flight was undertaken entirely over country that had not been prospected for landing grounds, etc., and the latter half of the journey, that is from Swan River, was over a wilderness. The total flying time for the journey was 6 hr. 12 min.

Considerable credit is due to the crew in attempting such a journey, and it speaks well for the excellence of the three-seater Avro and the Le Rhone engine that the entire trip was accomplished without any trouble whatsoever.

## MALAYA.

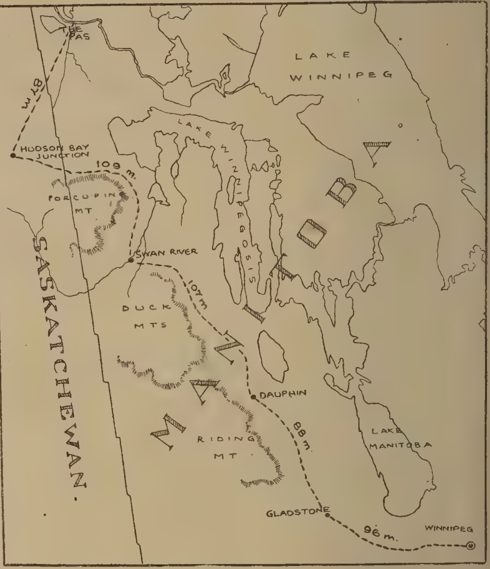
### Aeroplanes for Forest Surveys.

In a report on the forests of British Malaya Mr. E. Cubitt, Conservator of Forests, Federated Malay States and Straits Settlements, makes reference to the possible use of aeroplanes for survey purposes. The forest reserves of British Malaya cover nearly 3,000 square miles, and will probably be doubled in a few years; but up to the end of 1919 maps on a scale of four inches to a mile or over were available for only about a tenth of this area, and some of these contain insufficient detail.

The use of aeroplanes for forest survey purposes, writes Mr. Cubitt, now demands serious consideration. Forest officers who served in the Flying Corps during the war are convinced of its practicability.

There would be considerable difficulty in Malaya in the provision of landing-places, but the narrowness of the peninsula and its long coastline suggest that seaplanes would be especially useful.

**Messrs. H. Dougall and F. H. Ellis, who on an Avro biplane (110-h.p. Le Rhône), together with Mr. F. J. Stanley, flew from Winnipeg to The Pas, a distance of 487 miles over virgin country in 6 hr. 12 min. flying time.**



**A Sketch Map of the Flight from Winnipeg to The Pas mentioned in the previous column.**

## SOUTH AFRICA.

### A Fatal Accident.

At Pretoria on Dec. 15th an accident occurred which resulted in the death of the owner of the machine, his wife, and the pilot. According to the Johannesburg *Star*, it appears that a Mr. S. Brick purchased an Avro biplane at the sale of the property of the South African Aerial Transports, Ltd. It was his intention to fly back in the machine to Johannesburg, taking his wife with him. The pilot, Mr. F. V. Preller (late R.A.F.), made a short preparatory test flight of 10 minutes, and at about 17.20 he got away with Mr. and Mrs. Brick as passengers. On reaching an altitude of about 150 feet, he attempted a vertical bank, sideslipped and crashed. Of the three unfortunate occupants, Mr. and Mrs. Brick were killed instantly, and Mr. Preller died three hours afterwards in hospital. It is presumed that Mr. Preller, who since his demobilisation had been flying a D.H.6, in which Mr. Brick had made no fewer than 42 flights, had grown unaccustomed to the Avro, and had attempted to do too much with a heavily loaded machine.

### Artificial Rainmaking by Aircraft.

An experiment in artificial rainmaking was carried out in Pretoria on Oct. 5th by the Union Air Force at the instigation of the Department of Irrigation. The Defence Department placed an Avro biplane at the disposal of the experimenters and had built into it two sand-boxes, one holding 25 lb. of sand, which could be released rapidly, and another holding 75 lb., which could be spread over the clouds.

Piloted by Lieut. Holthouse, the machine got off at 2.30 p.m. and climbed above the clouds, which were some 5,000 ft. high. For some time the machine was lost to view, during which time the sand was released, but no signs of either sand or rain were noticeable to the group of Irrigation and Meteorological officials who witnessed the experiment.

The result of the experiment was not encouraging, and it may be concluded that, under the condition of the experiment, it is not likely that rain can be produced in this way, although by the use of a larger machine, capable of carrying a larger quantity of dust or sand, different results may be obtained.

# FOREIGN INTELLIGENCE.

## FRANCE.

### The Third Aerial Conference in Paris.

It has been reported that Gen. Sykes will represent Great Britain at the Third Aerial Conference with the representatives of France and Belgium, in Paris, on Feb. 21st and 22nd.

A correspondent of THE AEROPLANE in France writes :—

### Professional Parachutistes.

Two French ladies have taken up parachute descents as a profession, Madame de Nuzières with the "Guardian Angel," and Mlle. Renée Jacquart with a Jean Ors apparatus.

### A Postal Service in Palestine.

A regular military and civil postal service is running between Aleppo and Alexandretta every other day.—E. N.

### Finance and Aviation.

According to *L'Auto* it is expected that the new Minister of Finance, in accordance with the continual demand for economy, will institute a régime of "compression" when dealing with the various important budgets. Therefore it is feared that Aviation will still remain the underfed and ill-nourished member of the family, as under the previous Ministry, and that the necessary credits for its development will only be met by lively parliamentary debates during the discussion of the Budget.

### Hanoi—Saigon.

Two aeroplanes, carrying M. Le Gallen, acting Governor-General of Indo-China, and M. Bose, chief resident of Laos, as passengers, and accompanied by two flying-boats from Haiphong, left Hanoi on Jan. 13th for Saigon, and in spite of the bad weather reached Vinh in 1¾ hours.

On the following day the flight was continued to Takhet, on the Mekong River. On the 15th M. le Gallen and M. Bosc transferred to the flying-boats, the former continuing his flight south to Kratie, the latter going N.E. to Zieng-Khouang.

On the 16th M. le Gallen left Kratie for Saigon, calling at Thudoumot for petrol.

The flight of 1,400 kilos was carried out over a period of three days, without any preparation, and on French service aircraft.

## GERMANY.

THE AEROPLANE correspondent in Germany writes :—

### The Deutsche Luftreederei.

The Deutsche Luftreederei, it may be remembered, had to stop its Berlin-Brunswick-Essen regular flights, which only begun on Nov. 15th, owing to a notification on the part of the Air Control Commission, as the landing-place at Essen-Rotthausen was situated inside the 50-kilometre zone, east of the Rhine, and was looked upon as a military fortification.

There being a decided demand for a rapid postal service with Germany's great industrial districts, especially now, when the ordinary mail transport is much slower and more uncertain than in days of peace, the D.L.R. has decided to open up traffic to Dortmund via Brunswick and later on to Gelsenkirchen.

Permission has now been received for it to reopen all its services, and it is intended shortly to open two new postal services, one between Dresden and Leipsig and the other between Dresden and Berlin.

### A Large Aviation Syndicate.

A Mid-German Aviation Syndicate is in course of formation to unite the most important German industrial districts, such as Thuringia, the Ruhr district, and Upper Silesia.

Stations are to be erected in 30 towns, should the concern be floated as smoothly as the organisers, whose headquarters are at Merseburg, hope.—G. B.

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# THE ROYAL AERONAUTICAL SOCIETY.

## WEEKLY NOTICES.

### MEETINGS.

Sir Joseph Petavel, K.B.E., will preside at Mr. Handley Page's lecture on "The Handley Page Wing," which is to commence at 5.30 p.m. on Thursday, Feb. 17th, in the theatre of the Royal Society of Arts, John Street, Adelphi.

The following meeting will take place on Thursday, March 3rd, commencing at 5 p.m., when two papers will be read: "Airship Fabrics," by Mr. J. W. W. Dyer, and "Parachutes," by Major Orde Lees, O.B.E., A.F.C. Air Commodore E. M. Maitland, C.M.G., D.S.O., A.F.C., will be in the Chair.

### OLYMPIA EFFICIENCY EXHIBITION.

At the request of the Higher Production Council it has been arranged for Mr. White Smith to read a paper on "Commercial Aeroplane and Seaplane Transport," in the lecture hall at Olympia at 11.0 a.m. on Friday, Feb. 25th, to be followed by a similar paper on "Commercial Airship Transport," by Mr. C. I. R. Campbell, O.B.E., M.I.M.A., Major Sir John Baird, Bart., C.M.G., D.S.O., M.P., will take the Chair.

### MANCHESTER SOCEETY OF ENGINEERS.

At the request of the Manchester Society of Engineers, it has been arranged for the Chairman (Air Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C.) to read a paper on "Some Problems in the Design and Operation of Aircraft" before the members of that body, at 7 p.m., on Wednesday evening, March 2nd.

### DONATION.

The Council desire gratefully to acknowledge the receipt from Mr. Alma Baker, Honorary Member, of a presentation copy of his "Souvenir of the Australian and Malaya Battleplanes, 1914-1918," which has been prepared as a record of the efforts made to assist the Home Government during the War by presenting aeroplanes to the Royal Flying Corps and Royal Air Force; as a result of which sufficient money was subscribed to purchase 94 aeroplanes.

### JOURNAL.

Copies of the following numbers of the Journal are urgently required and the Secretary would be grateful if any member who does not desire to retain his copies for filing purposes would be kind enough to return them, as these numbers are quite out of print:—January, March, April and June, 1920.

Royal Aeronautical Society, W. LOCKWOOD MARSH,
7, Albemarle Street, W.1, Feb. 11th, 1921. Secretary

# THE ROYAL AERO CLUB.

## ANNUAL GENERAL MEETING.

The Annual General Meeting of the Members of the Royal Aero Club of the United Kingdom will be held on Wednesday, March 30th, 1921, at 3, Clifford Street, New Bond Street, London, W.1, at 6 p.m.

Notices of Motion for the Annual General Meeting must be received by the Secretary not less than 21 days before the Meeting, and must be signed by at least five Members.

### COMMITTEE.

In accordance with the Rules, the Committee shall consist of 18 Members. Members are elected to serve for two years, half the Committee retiring annually.

Retiring Members are eligible for re-election.

The retiring Members of the Committee are Lieut.-Col. John D. Dunville, Lieut.-Col. Spenser D. A. Grey, D.S.O., Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Squadron-Leader T. O'B. Hubbard, M.C., R.A.F., Lieut.-Col. F. K. McClean, Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F, The Viscount Northcliffe, Lieut.-Col. Alec Ogilvie, F Handley Page

Any two Members of the Club can nominate a Member to serve on the Committee provided the consent of the Member has been previously obtained. The name of the Member thus nominated, with the name of his proposer and seconder, must be sent in writing to the Secretary not less than fourteen days before the Annual General Meeting.

### FLYING SERVICES FUND COMMITTEE.

—A Meeting of the Flying Services Fund Committee was held on Friday, Jan. 28th, 1921, when there were present Group-Capt. C. R. Samson, C.M.G., D.S.O., R.A.F., in the chair, Mr. Chester Fox, Squadron-Leader T. O'B. Hubbard, M.C., R.A.F., and the Secretary.

APPLICATIONS FOR ASSISTANCE.—Forty-six applications for assistance were considered, and Grants and Allowances were voted amounting to £611 18s. 3d.

### RACING COMMITTEE.

A Meeting of the Racing Committee was held on Wednesday, Feb. 2nd, 1921, when there were present Major-General Sir Sefton Brancker, K.C.B., in the chair; Col. F. Lindsay Lloyd, C.M.G., C.B.E.

The following attended by invitation:—Capt. H. E. P. D. Acland (Messrs. Vickers Ltd.), Commander James Bird (Supermarine Aviation Works, Ltd.), Mr. E. B. Parker (Messrs. Short Bros.), Mr. Rhodes (Blackburn Aeroplane and Motor Co.), Mr O E Simmonds (Cambridge University Aeronautical Society), Harold E. Perrin Secretary.

SCHNEIDER CUP, 1921.—The regulations for the Race for 1921 were reported.

The question of the Club making a grant towards the expenses of the British Competitors was discussed and referred to the Club Committee.

BRITISH SEAPLANE RACES.—It was decided not to proceed with the proposed Seaplane Circuit of Great Britain, but to endeavour to arrange a series of races at Cowes during August.

### COMMITTEE MEETING.

A Meeting of the Committee was held on Wednesday, Feb. 9th, 1921, when there were present Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the chair, Major-General Sir Sefton Brancker, K.C.B., Mr. Ernest C Bucknall, Col. F. Lindsay Lloyd, C.M.G., C.B.E., Lieut.-Col. Alec. Ogilvie, Lieut.-Col. Mervyn O'Gorman, C.B., Group-Capt. C. R. Samson, C.M.G., D.S.O., R.A.F., and the Secretary.

ELECTION OF MEMBERS.—The following new Members were elected:—Ernest Allen, William Karl Arnott, Ernest Basil Kelsey, William John Ley (late Lieut., R.A.F.), Luigi Mapelli di Pietro.

SUB-COMMITTEES.—Reports from the following Sub-Committees were received and adopted:—Racing Committee; Finance Committee; Flying Services Fund Committee.

AVIATORS' CERTIFICATES.—The following Aviators' Certificates were granted:—7909 Joseph Louis Mazzucco, 7910 Charles Clinton Briggs, 7911 Henry George Crowe, M.C

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*Translated from French.*

### INTERNATIONAL MICHELIN CUP

(Open to all countries affiliated to the F.A.I.) under the Regulations of the F.A.I.; 20,000 francs per annum for 8 years (total 160,000 francs).

### GENERAL REGULATIONS.

Messrs. A. and E. Michelin have entrusted to the Aero Club de France the drawing up of the Regulations, which will be revised each year according to the importance of the progress made. These Regulations must be ratified by Messrs. Michelin.

ARE. 1.—Each year, before Jan., 1st, the Regulations will be forwarded by the Aero Club de France to all federations or Clubs affiliated to the F.A.I.

ART. 2.—The winner of the Cup, each year, will be the pilot of the aircraft, which, at the expiration of the year in question, is the holder of the record, in accordance with the regulations for the year in question.

No one may compete who is not a Member of the Club (federated or affiliated) of the country in which the attempt is made.

ART. 3.—The record, to be valid, must have been ratified by the Federation or Club controlling aeronautical sport in each country, in accordance with the statutes and regulations of the F.A.I.

The tests will be controlled in each country by the Aviation Commission of the Club recognised by the Federation.

ART. 4.—The winner of the Cup each year will receive in addition to a replica in bronze of the *objet d'art* of the value of 10,000 francs (which constitutes the Cup) a sum of 20,000 francs, which will be awarded within 30 days of the ratification of his record.

ART. 5.—Each year a similar replica will be forwarded to the federated Club of the country in which the record has been established provided the Club does not already possess a replica.

The original will be awarded to the Club finally holding the Cup.

ART. 6.—If the Cup is not won in any one year, the amount of the prize will be added to the 20,000 francs for the following year and so on.

### REGULATIONS FOR 1921

### TOUR DE FRANCE PRIZE

ART. 1.—In accordance with Art. 4 of the General Regulations, the Michelin Cup, 1921, will be endowed with a sum of 20,000 francs.

The holder of the Cup for 1921 will be the pilot of an aircraft, Class C (flying machine), who, before Jan. 1st, 1922, has covered at the greatest commercial speed per hour, a course in a closed circuit of about 3,000 kilometres, in accordance with the present Regulations.

A diploma and a replica of the Michelin Cup by Moreau-Vauthier will also be awarded to each Competitor who properly completes the course.

ART. 2.—For the tests carried out under the control of the Aero Club de France, the closed circuit, called the Tour de France, will include 15 landings, to be made on each of the landing grounds of the following towns:—Versailles (Buc, Chateaufort, Saint-Cyr or Villacoublay), Amiens, Chalons, Saint-Dizier, Gray, Joigny, Beaune, Vienne, Nimes, Pau, Saint-Andre de Cubzac, Romorantin, Angers, Evreux, Saint-Inglevert (8 kilometres de Calais), Versailles (Buc, Chateaufort, Saint-Cyr, or Villacoublay).

The landings must be made in the above order, but flights may be started and completed at any one of the points indicated.

The landings will be verified by a log book which will be forwarded to each competitor on entering. On arriving at a landing place the competitor's log book will be signed by an official or by two witnesses of the landing. The pilot may be required to produce his pilot's certificate at each landing.

ART. 3.—The commercial speed* over the whole of the closed circuit must be at least 75 km. per hour.

ART. 4.—Intermediate landings, replenishments and repairs are allowed. Changing the aircraft is not permitted.

The crankcase and the cylinders of the motor will be sealed or stamped.

Towing is only allowed at walking pace.

ART. 5.—The entry form signed by the pilot must reach the Club organising the contest two days before the day of starting, before 6 p.m.†

It must indicate the point of departure that has been selected, and the day of starting.

The entry fee, which is not returnable, is 100 francs for the pilot's first entry and 25 francs for subsequent entries during the year.

The entry is valid for starting during four consecutive days, the first of these four days being the day indicated on the entry form.

During these four days the pilot may make as many starts as he likes, provided the starts are made from the place indicated on the entry form.

ART. 6.—When the tests are not carried out in France, the closed circuit must consist of at least 3,000 kms., and there must be at least 15 compulsory landing places.

The circuit established under these conditions, with an outline and difficulties similar to those of the French circuit, must be submitted for the approval of the Aero Club de France. The landing points must be marked on a map to be attached to the request for the approval of the circuit.

The contest must be carried out under the control of officials appointed by the Aero Club interested, together with an official timekeeper.

### SUCCESSIVE HOLDERS OF THE CUP.

1st year, 1908—Wilbur Wright, 124 kil. 700 in 2 hr. 20 min. 31 sec. (Le Mans), Dec. 31st, 1908.

2nd year, 1909—Henry Farman, 234 kil. 212 in 4 hr. 19 min. 32 3/5 sec. (Camp de Chalons), Nov. 3rd, 1909.

3rd year, 1910—Maurice Tabuteau, 582 kil. 935 in 7 hr. 48 min. 31 3/5 sec. (Buc), Dec. 30th, 1910.

4th year, 1911—Emmanuel Helen, 1,252 kil. 800. (Gidy-Lhumery) Sept. 8th, 1911.

5th year, 1912—Not contested.

6th year, 1913—Emmanuel Helen, 16,126 kil. 800. (Etampes-Cercottes), Oct. 31st to Nov. 29th, 1913.

7th year, 1914—Eugene Gilbert, 3,000 kil. (Tour de France), June 8th-9th, in 39 hr. 35 min. 42 sec.

Anyone wishing to compete for this Cup in England should communicate with the Secretary, Royal Aero Club, 3, Clifford Street, London, W.1, when a course will be arranged.

### INTERNATIONAL SEAPLANE RACE.

The Royal Aero Club has decided to contribute £1,000 towards the expenses of the British representatives competing in the International Seaplane Competition for the Jacques Schneider Trophy to be held in Venice in September.

Italy is the present holder, and each country is entitled to challenge with three Competitors. The Royal Aero Club will select the three competitors to represent Great Britain, and all inquiries should be addressed to the Secretary.

### GORDON BENNETT INTERNATIONAL BALLOON RACE, 1921.

The International Gordon Bennett Balloon Race will be held this year at Brussels in Sept next.

The British Competitors will be selected by the Royal Aero Club, and anyone wishing to compete should communicate at once with the Secretary.

### THE FLYING SERVICES FUND.

SUBSCRIPTIONS.

| | £ | s. | d. |
|---|---|---|---|
| Total Subscriptions received to Jan. 17th, 1921 | £17,183 | 12 | 7 |
| Rev. S. A. Norris Huntly, per Rev. R. E. Vernon Hanson, Deputy-Chaplain-in-Chief, R.A.F. | 0 | 10 | 6 |
| Total, Feb. 11th, 1921 | £17,184 | 3 | 1 |

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* The commercial speed is arrived at by dividing the total length of the course by the time which elapses between the departure of the aircraft from its starting point and its return to the same point.

† Sundays and holidays are not included. Entries may not be received on Sundays or holidays.

## PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]

### DEATH.

HICKS.—On Feb. 5th, at a nursing home, Worcester, William Peter Giffin Hicks, only son of Squadron-Leader W. C. Hicks, R.A.F., and Mrs. Hicks, and beloved grandson of W. Kilbourne-Kay and Mrs. Kay, of Battenhall, Worcester. Aged 4 years.

### MARRIAGE

BRAITHWAITE—AYLWIN-FOSTER.—At St. James's, Piccadilly, on Feb. 8th, Capt. Geoffrey G. Braithwaite (late The Queen's Royal Regt. T.F. and R.A.F.), son of Mr. and Mrs. C. Braithwaite, of Bridley Manor, Guildford, and Madelaine Edith Aylwin, youngest daughter of the late Rev. E. C. Aylwin-Foster, and the late Mrs. Aylwin-Foster, of Farnborough, Hants, and 15, Randolph Road, W.

### BIRTH.

HODSOLL.—On Feb. 11th, at Westfield, Oxshott, Surrey, Joyce, wife of Flt. Lieut. E. J. Hodsoll, R.A.F.—of a daughter.

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Arrol-Johnston, Ltd. ... *Front Cover*
Auster, Ltd. ... *Front Cover*
Beardmore Aero Engines, Ltd., The ... *Front Cover*
Beardmore, William, & Co., Ltd. ... 161
Bowden Brake Co., Ltd., The ... 172
Bray, Gibb & Co., Ltd. ... 171
Bristol Aeroplane Co., Ltd. ... 156
Cunard Line ... 172
De Havilland Aircraft Co., Ltd., The ... 156
Fairey Aviation Co., Ltd., The ... 151
Falcon Airscrew Co. ... 171
Firth, Thos., & Sons, Ltd. ... 167
Green Engine Co., Ltd. ... *Back Cover*
Hancock, James Lyne, Ltd. ... 172
Handley Page, Ltd. ... 167
Imray, Laurie, Norie & Wilson, Ltd. ... 172
Instone Air Line ... 168
MacLennan, John, & Co. ... *Front Cover*
Martinsyde, Ltd. ... 165
Metal Airscrew Co., Ltd. ... *Front Cover*
Naylor Brothers, Ltd ... 170
New Pegamoid, Ltd. ... 172
Nieuport and General Aircraft Co., Ltd. ... 165
Roe, A. V., & Co., Ltd. ... *Inside Front Cover*
Rolls-Royce, Ltd. ... 159
Rubery, Owen & Co. ... 171
Supermarine Aviation Works, Ltd. ... *Back Cover*
Titanine, Ltd. ... *Front Cover &* 153
Vickers, Ltd. ... 163
Wireless Press, Ltd. ... 170

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### PATENTS.

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The Postmaster-General gives notice that he is prepared to consider tenders from British aircraft firms for the conveyance of mails by aeroplane from London to Paris, from London to Brussels, and from London to Amsterdam.

Firms desiring to tender are hereby invited to apply to the Secretary, General Post Office, E.C.1, for a copy of the respective conditions of tender.

February 8th, 1921

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N.B.—Date postponed on account of number of Lots.

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# THE AEROPLANE

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## ON THINGS THAT ARE HAPPENING—II.

### Concerning the Airships.

Naturally in certain quarters there is considerable perturbation about the Air Council's decision to wash out the Airship Section or Wing or Group, or whatever it is called, of the R.A.F.

It certainly seems sad that officers who have devoted years to the theory and practice of building and handling airships should find their occupation gone. But that is all part of the fortunes of peace. After all, their lot is not so hard as that of an Army officer (and there are many such) who left the Army as a captain or major before the war, started in business, just reached the point of doing well, was called up for service at the outbreak of war, rose to the rank of Lieut.-Col. or Brigadier, is now demobilised at the age of forty-five or more and finds that all the business which he had built so laboriously has vanished during his six years or so of service.

The airship officers are mostly young men who can start in business if they have need to do so. Those who were Naval officers ,as many were, can go back to sea—where their knowledge of the air and of aircraft will be useful. Those who hold permanent commissions in the R.A.F must be found work in the R.A.F. other than as aeroplane pilots, or if they are young enough they must be taught to fly. Therefore, so far as one can see, no great personal hardship is produced.

On the other hand, much good will result in that a certain number of officers of a very good class and a large number of trained and disciplined men will be released for more useful work. Big airships require a personnel out of all proportion to the usefulness of the ships. The R.A.F. is alarmingly short of men who have been used to proper discipline, and so the airship personnel will be useful.

It is true that the majority of them are only "handling parties," but at any rate they are disciplined and so will be useful at aeroplane stations for guard duties, fatigue parties, and so forth, which will release mechanics (who are badly needed) for their proper work. Also a certain proportion of the airship "other ranks" are very skilled mechanics. They, of course, will be most useful at aeroplane stations.

So far as the airships themselves are concerned, those which we have to-day (including the Zeppelins) are absolutely useless as weapons of war, and are very little use as vehicles of peace. A certain amount of knowledge can be gained from them—as for example whereabouts there is a 1,200 foot mountain in East Yorkshire and how long it takes a 45-m.p.h. wind to break up a ship attached to a three-wire mooring. But such knowledge can be gained without the vast personnel necessary when the various airship stations are maintained on a Service basis.

One gathers that the Department of Civil Aviation is to operate a few airships experimentally during the year This, of course, is quite in keeping with our topsy-turvy methods, seeing that "Aviation" is specifically the art, science and practice of flying and is not concerned with floating. Strictly speaking the two branches of "Aeronautics" (aerial navigation) are "Aviation" which means maintaining a machine in the air by dynamic means and is derived from "avis," a bird and so means "birding," and "Aerostation" which means maintaining a machine in the air by static means and so means floating.

Therefore the Department of Civil Aviation should not touch Aerostation. Which is a very good reason for doing so. After all it is better that the Department should spend money on experiments with airships than that it should save its money as it has done this year and then have it stolen by the Ministry of Munitions.

Moreover the airship has possibilities as a vehicle of peace though it has none as a weapon of war until such time as helium gas can be produced on a commercial basis. Personally one hates the idea of floating about the Earth suspended below a million or so cubic feet of highly inflammable gas along with some thousands of gallons of equally highly inflammable spirit, but other people may not be so particular, or may possess that ignorance which is bliss.

At the same time, when, as will happen some day, a passenger airship goes to glory in one beautiful puff of smoke, as L.II did at Johannisthal in 1913, but with thirty or forty passengers on board beside the crew—the *Daily Mail* will have the time of its life. And it will not do any good to Civil Aerostation or to the Department of Civil Aviation.

As weapons of war airships would still be useful against savage tribes which have no aeroplanes, as for example against Bolsheviks or Afghans. But, despite all the theories about surrounding the gas-bags with a blanket of inert gas (such as the gas from the engine exhausts) an airship with a speed of 80 or 90 or even 100 miles an hour would stand a poor chance against the big new aeroplanes, or flying-boats of the "Titania" type, with a speed of 120 to 130 miles an hour and armed with 37 millimetre quick-firers using incendiary shells.

The airship's only real chance of survival is helium. The only people who are at all likely to produce helium at a cost which would make it usable on airships-of-war are the Americans, because they have the natural gas wells, and even they do not hope to bring the cost down to such a level as to make helium possible for commercial airships. Therefore we had better leave the development of airships to the United States, who will find helium-filled ships useful in their war with Japan. And when they have developed them we can acquire them just as we acquired telephones and gramophones and other articles of commerce.

In the meantime it may be worth while to develop hydrogen-filled airships for use on the trans-Atlantic mail service. It must be many years before our aeroplanes can be trusted to do the journey with unfailing regularity.

### The Port of London.

What is in fact far more important than developing airships is the proper development of the air-port of London. Long before anybody else thought of saying so in print this paper began impressing on its readers that the proper way to develop aerial transport, at any rate so far as passengers and mails are concerned, is by way of amphibian aeroplanes operating from and onto the great rivers of the European Capitals. Why waste half an hour or more going to or from Cricklewood or Croydon when in five or ten minutes one can go down to the Temple Steps or Westminster Bridge and embark there on a machine which will land one on the Seine in the middle of Paris, or alongside the docks at Antwerp or Rotterdam or Amsterdam, or on the Rhine in Köln, or on the Spree in Berlin for that matter?

Long before the war Mr. Frank McClean—the father of British Naval Aviation—first showed that the Thames is London's real aerodrome. Then the Fairey Aviation Company used the River regularly and commercially for its proper purpose. Now, nearly two years later the Port of London Authority, which was apparently ignorant of the existence of aeroplanes in 1919, asks for a demonstration, which was given recently in a thoroughly conclusive manner by Capts. Cockerell and Broome (the Heavenly Twins) with the Napier-engined Vickers "Viking" amphibian. So now what about it?

Is the Port of London Authority going to license aeroplanes, whether amphibians, float-machines or flying-boats, to use the River, as it licenses barges, wherries and other river craft? Or is the Department of Civil Aviation going to license the River as an aerodrome? Or are the P. of L.A. and the D.C.A. going to co-operate and order that "river-worthiness" certificates be acquired for all aeroplanes which use the River, and that all pilots of such machines shall hold a waterman's licence and so be eligible to compete for Doggett's Coat and Badge, or must the pilots hold Master-Mariners' Certificates, seeing that the new requirements for Aeroplane Pilots' licences seem to demand about an equal amount of knowledge.

In any case it is satisfactory to see that a start is being made in the direction of using the Thames as it was obviously intended to be used. It will be interesting to see who first starts an air line operating regularly from and to the River.

As already mentioned, it is more suitable for mail and passenger work than for cargo machines, for an amphibian aeroplane is bound to be heavier than a land-going machine, and so, if they are wise, the operators of air lines in the futur will use very large lightly-built land aeroplanes for thei goods traffic, so as to get the maximum paying load fc their engine power. But first of all it will be necessary t find a few real business men who can command both Capita and Brains to start those air lines.—C. G. G.

## THE EDITOR'S HOLIDAY.

Mr. C. G. Grey, the editor of THE AEROPLANE, left England on Feb. 14th for the Riviera on a holiday of some weeks' duration. His health has been unsatisfactory for some time and the doctors have at last succeeded in defeating his dislike for holidays. It is the first time in ten years that he has taken adequate leave and one can only hope that he will return full of vigour to assist aeronautical progress—an interest which has become his life's work. There are few who have devoted their entire energies in a new cause with such utter devotion and with so little thought of gain.

In his absence the acting editor requests those responsible for the incidents of the common day not to permit things of great importance to happen until the real editor returns to attack or to defend.—W. E. DE B. W.

## THE SECRETARY OF STATE FOR AIR.

As will be seen from Aircraft in Parliament on page 194, no new appointment has yet been made of a Secretary of State for Air, and Mr. Churchill continues in the office until the Estimates have been presented.

Rumour, rarely reliable but always intriguing, has so far only appointed the Marquess of Londonderry and Major-Gen. Seely to that office. It is to be hoped that the former report be true, for there has never been a time in the history of aviation when a definite policy in aeronautical matters, free from eccentricity and personal verbosity, was more vital if future prosperity be desired.

## THE ENGLAND-AUSTRALIA FLIGHT.

Sir Ross Smith, K.B.E., and Sir Keith Smith, K.B.E., who flew to Australia from London in the 27 days following Nov. 12th, 1919, arrived in England on Feb. 17th. On their way through Paris on Tuesday, Feb. 15th, they were entertained at a reception given by the Aero Club de France. M. André Michelin, the President of the Club, gave an address in the felicitous phrases which are the birthright of the French, and presented them both with commemorative medals.

It is ironic that though the leading authority in a foreign country for the sport of aviation thus honours a great feat, the Royal Aero Club, which occupies officially a similar position in the Mother country of the two aviators, is making no preparations to give them an adequate reception. Gold medals are to be presented, but nothing is yet known as to the way in which these mementos will reach the aviators. The French action is an instance of the inborn national chivalry and the lack of action on the part of the Royal Aero Club simply a proof of failure to carry out an obvious duty.

The history of the Royal Aero Club is a chronicle of lost opportunities, and the last is in many ways the greatest of all. The excuse of the Committee is, one understands, that the flight took place so long ago as to be beyond public memory. No worse apology could be made. Civil aviation is in none too happy a condition to-day and it is surely obvious that a due public recognition of the great work done for the cause of aeronautics by the two Smiths in the London-Australia flight could only be for the general good of the industry and the sport. There is much virtue in all that underlies the phrase, "Lest we forget." The Royal Aero Club, excellent as a bar, is futile as a headquarters of the sport of aviation.

Though the Royal Aero Club has made little effort to enter tain Sir Ross and Sir Keith Smith, others have not faile to show them honour. On Friday, Feb. 18th, they were er tertained at lunch at the Savoy Hotel by Sir Frederick Syke G.B.E., K.C.B., Controller-General of Civil Aviation. Co Amery, Under Secretary of State for the Colonies, Sir Edwar Lucas, Agent-General for South Australia, and others wer present.

On Feb. 23rd they will be given a lunch at the Hyde Par Hotel by the Overseas Club, and Major-General the Righ Hon. J. E. B. Seely, C.B., C.M.G., D.S.O., will be in th chair. On the following day a lunch is to be given in thei honour at the Connaught Rooms by the Imperial Fleet Con mittee, when the Lord Desborough will preside.

Sir Ross Smith will on March 7th and succeeding night deliver at the Philharmonic Hall a "Travelogue" on his fligh to Australia, illustrated by lantern slides and cinematograp films taken during the journey. On the first night the Lor Desborough will preside.—W. E. DE B. W.

## CROYDON VERSUS HENDON.

Everyone at Croydon is hoping that the Royal Aero Clu and the Department of Civil Aviation will do the right thin and arrange to hold the sporting events at Croydon instea of Hendon this year. All the main joy-riding firms—that i the firms who make pleasure-flying the entire source of thei daily bread—are situated at Croydon.

There is no interest whatever in flying at Hendon, and on believes that if any joy-riding firm still exists there the would be just as pleased to go over to Croydon for the da in question, if indeed they took any notice of the event at al

Hendon is now engaged in business other than flying, whil Croydon exists on and for flying alone. It is the bounde duty of the Royal Aero Club and the Department of Civi Aviation to do all that is in their power to make the publi go to Croydon in the same numbers as they went to Hendo before the war.

In a week or so there will be quite a number of pleasur flying machines at Croydon and a few small prizes for cross country handicap races, as at Hendon, to prominent land marks such as Addiscombe Wood or the Crystal Palace during which races paying passengers could be carried, woul not only be good for the firms themselves but would jus give that fillip to flying which is now all that is necessar to bring success.

Moreover, it might have the effect of bringing some who like the late Mr. Gustav Hamel, Lord Carbery and others, kep private machines and flew for the sport of the thing.

People who presented cups would, incidentally, get quit a good share of free advertisement.

## THE REVIVAL OF THE AIR LINES.

For the first time this year there have been machines t the Continent every day during the week (except Sunday) Twenty-eight machines operated between England and th Continent, of which nine were British and nineteen foreign It is reported that a new British air line will start in Marc or April, using big twin-engined freighter machines of a typ which has not yet been used on regular Continental flights They also propose to use a French type of machine as well.—
C. D.

# NAVAL AND MILITARY AERONAUTICS.

## GREAT BRITAIN.

### Short Service Commissions.

The Air Ministry announce that they are offering a limited number of short service commissions in the Royal Air Force. These commissions will be for periods of four to five years on the active list, followed by a period in the Reserve, and applicants—who must be between the ages of 19 and 25 and the sons of natural-born British subjects—will be required to pass a medical examination, after which, subject to selection, they will be graded as probationary pilot officers, and will be posted to one of the Royal Air Force Flying Training Schools. After six months these probationary officers will be confirmed in their rank, subject to their showing "air fitness" and satisfactory progress in their studies of aviation and other subjects.

As regards pay and promotion, short service officers will be on exactly the same footing as regular Air Force officers, and, whilst they will not qualify for a pension, they will be eligible on completion of service for a gratuity at the rate of £75 per annum for each year of actual service on full pay. Intending applicants can obtain further information from the Royal Air Force Officer-in-Charge, Officers' Section, 4, Henrietta Street Covent Garden, W.C.2.

### Boy Mechanics for R.A.F.

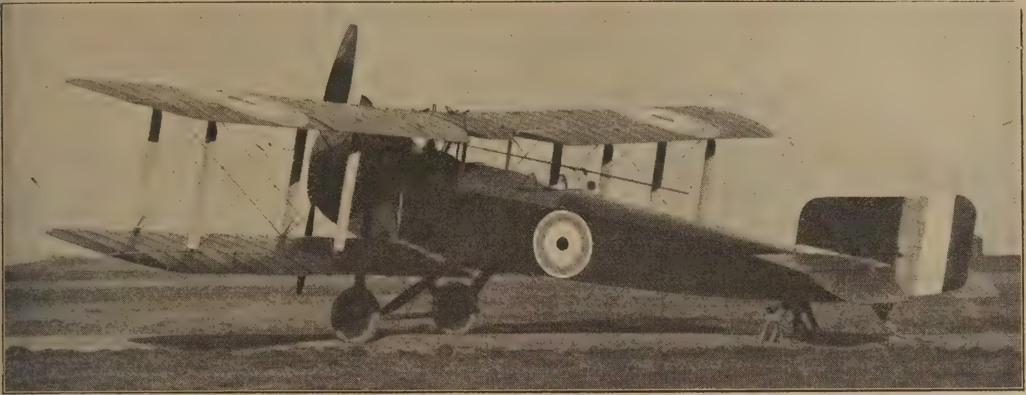
The Civil Service Commissioners announce that an ope competitive examination for the entry of boy mechanics t the Royal Air Force will be held in London, Edinburgh Dublin, Birmingham, Bristol, Chatham, Leeds, Manchester Newcastle-on-Tyne, Norwich, Plymouth, and Portsmouth o May 27th. The limits of age are 15-16½ on July 1st, 1921 Regulations and forms of application will be sent in respons to requests by letter addressed to the Secretary, Civil Servic Commission, Burlington Gardens, London, W.1, on and afte March 1st.

### The Army Dental Corps.

Under a Royal Warrant issued on Jan. 17th a corps to b known as the "Army Dental Corps" was authorised. It i to be a joint Service for the Army and the Royal Air Forc and will be under the direction of the Director-General, Arm Medical Service.

Though Army ranks will be used and the whole force ap parently paid and administered by the Army, personnel wil

# Another Manifestation.



N.10.—The original "Type III." Fairey Seaplane—fitted by the Royal Naval Air Service with a shoregoing undercarriage for experiments in "deck-flying" in 1917. This same machine, with the same wings and the same tail-unit, but with a Napier engine and an amphibian undercarriage, competed in the Amphibian Class in the Air Ministry Competition in September, 1920, and put up a performance equal to that of the most modern flying-boats.

## THE HISTORY OF A SEAPLANE.

She was designed in 1916; She was delivered to the R.N.A.S. in April, 1917; She was on Service till after the Armistice; She was bought back in May, 1919, as a "Disposal" Machine; She was used to carry newspapers from Blackfriars to Thanet early in 1919; She was used for Experimental Work during the Summer of 1919; She was flown in the Schneider Cup Race in September, 1919, and was the only competitor to return intact and under her own power; She was used with experimental Amphibian Undercarriages during the early part of 1920; She did Ferry Work between Southampton and Sheerness as a Seaplane in the Summer of 1920; She has survived Nine Different Engines. In September, 1920, She competed in the Air Ministry Competition for Amphibian Aeroplanes.

In all this work no single Component Part, except the Undercarriage, has been replaced. Fuselage, Wings, Tail-Plane, Rudder, Elevators, Fin, Tail-Float, even the Engine-Bearers, are those originally fitted. The Wings have only been re-covered once, the Tail-Uuit still has the original fabric. The Cock-Pit has been altered to carry one, two, and three people.

***APRIL, 1917—OCTOBER, 1920.***
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be expected to serve either in the Army or the R.A.F. as required.

It is unfortunate, in view of the advantages obtained by the formation of administrative corps with joint functions in the two Services, that the formation of the Royal Air Force was ever carried into effect. It will be difficult now that Royal Air Force tradition is growing so strongly to re-divide that Force into its original forms as arms of the two older Services.

### Recommissioning of H.M.S. "Argus."

H.M.S. Aircraft-carrier *Argus* was recommissioned for further service with the Atlantic Fleet on Jan. 6th at Portsmouth, to which port she has been transferred from Devonport for manning purposes.

### The R.A.F. Reserve

It is officially stated that men belonging to Class "E," R.A.F. Reserve, are not eligible for enlistment with the Territorial Force; but it has been agreed by the Air Ministry that, in the case of such reservists who have already enlisted into Territorial Force units, such enlistments may stand as special cases.

## BRAZIL.

### A New Height Record.

The Brazilian height record, till then held by an N.C.O. pilot of the Brazilian Military School of Flying, was raised to 6,200 metres on Sept. 28th, 1920, by Capt. Dumont, of the French Mission, flying a S.P.A.D.

## FRANCE.

### French Mission in Brazil to Return.

The French Military Aviation Mission in Brazil will leave Rio de Janeiro from France some time during this month.

### Experiments on Aircraft-carrier "Bearn."

Experiments have been carried out recently in landing on the deck of the Aircraft-carrier *Béarn* whilst moored in the Toulon roads.

The method used in landing is exactly similar to that experimented with at the Isle of Grain, and consists of a certain number of wires stretched across the landing-deck, and to which are attached sand-bags. The machine, which has a special hook attached to the tail-skid, on landing picks up these wires one by one, the sand-bags acting as a brake, the load being gradually increased until the machine is brought to a stop.

After many landings had been carried out with single-seaters, Lieut. de Vaisseau Teste, who is in charge of the flying experiments, made a successful landing on a Sopwith 1½-strutter, with a passenger, in the presence of the Minister of Marine.

After the landing-platform has been lengthened the experiments will be continued.

## ITALY.

### Italy's Surrendered Zeppelin.

It has ben reported from Berlin that the L.61, which was delivered safely by a German crew to Italy, has sustained such damage that it will have to be broken up. It appears that whilst in a trial flight, owing to an unexplained failure of the steering-gear when landing, the airship sustained a considerable amount of structural damage, three members of the Italian crew being killed and several others severely injured.

The Italian authorities applied to the German aeronautical engineers for essential parts and accessories to replace those that had been wrecked, it having been found that the repairs could not be carried out in Italy. The request was refused on the ground that it would be contrary to the provisions of the Peace Treaty to supply any of the Allied Powers with airship parts, as all had to be destroyed without exception.

The Italians then endeavoured to induce German engineers and mechanics to proceed to Italy to repair the wreck, but without success.

It is now stated in Germany, with ill-concealed satisfaction, that the Italians have come to the conclusion that the L.61 must be scrapped.

Particular stress is laid on the fact that the airship was safely navigated over the Alps by a German crew, and that the crew even remained in Italy for weeks in order to instruct the Italian crew properly.

## UNITED STATES OF AMERICA.

### A Happy Possibility.

There is in the United States of America a similar divergence of opinion in regard to the respective values of aircraft and capital ships to that now common in England. Mr. Daniels, the Secretary of the Navy, whose incapacity is only exceeded by his arrogance, has, apparently infuriated by the subtle attacks of clever opponents, stated that he is willing to command the captured German battleship *Ost Friesland* for a few hours while attempts are made to bombard her from the air provided his dearest enemy, Brigadier-General Mitchell, Chief of Army Air Operations, agrees to pilot the attacking aeroplanes Mr. Daniels is no believer in the vulnerability of warships to aerial attack It is to be hoped that General Mitchell will accept the challenge and that his aim will be accurate.

Whether this challenge is put to the test or not, the *Ost Friesland* is to be bombarded from the air as a matter of intensive experiment.

# CIVIL FLYING DURING THE PAST YEAR.

The Air Ministry announced on Feb. 16th that:—

Since the opening of civil aviation in May, 1919, British aircraft have flown considerably more than a million and a half miles, the approximate figures to the end of last year being 1,556,000. For the quarter ending December, 1920, the number of miles was 175,000 as compared with 138,000 in the same quarter of 1919, although the number of flights was considerably less. The number of flights reported since May, 1919, was 62,003.

The total number of passengers carried to Dec. 31st was 106,712, the figures for the last quarter being 6,427, a slight increase over the number of 6,284 for the same period in the previous year.

Goods carried—almost entirely on Continental services—weighed 167 tons, the weight for the last quarter being 34½ tons, which is a substantial increase over the figure for that quarter in 1919 and is considerably above the average quarterly weight throughout.

There were three accidents to machines during the quarter, one of these only with fatal results. For the whole period under review the number of accidents was 48, but of these 20 did not involve injury to personnel. The number of machine-miles flown per flying accident is 33,100. The rate of passengers killed per thousand carried was 0.10 and for passengers injured 0.15.

The attached returns are compiled from reports furnished voluntarily by the firms engaged in air transport.

Civil Aviation Returns.

Quarter ending Dec. 31st, 1920.

| | Quarter Ending 31/12/20. | Quarter Ending 31/12/19. | Totals from May, 1919 to Dec. 1920 |
|---|---|---|---|
| Number of machine flights ... | 3,524 | 4,170 | 62,003 |
| Numbr of machine hours flown | 2,125 | 1,852 | 19,952 |
| Average duration of each flight (mins.) ... ... ... | 36 | 26 | 19 |
| Approx. machine mileage ... | 175,000 | 138,000 | 1,556,000 |
| Number of passengers carried | 6,427 | 6,284 | 106,712 |
| Weight of goods carried (tons) | 34½ | 9¾ | 167 |

| | | | |
|---|---|---|---|
| Accidents: | | | |
| Flying accidents resulting in death to one or more occupants of machine ... ... | 1 | 2 | 8 |
| Non-fatal flying accidents resulting in injury to occupants of machine ... ... | 1 | — | 18 |
| Flying accidents resulting in death of third party ... ... | — | — | 1 |
| Non-flying accidents resulting in injury of third party (propeller accident) ... ... | — | — | 1 |
| Flying accidents not involving injury to personnel ... ... | 1 | 3 | 20 |
| | 3 | 5 | 48 |
| Casualties to Personnel: | | | |
| Pilots killed ... ... ... | 1 | 2 | 8 |
| Pilots injured ... ... ... | 1 | — | 14 |
| Passengers killed ... ... | 3 | 1 | 11 |
| Passengers injured ... ... | 1 | — | 16 |
| Third party killed ... ... | — | — | 1 |
| Third party injured .. ... | — | — | 1 |

Accident and Casualty Rates:

| | From May, 1919 to Dec., 1920 |
|---|---|
| Machine miles per flying accident ... ... .. ... | 33,100 |
| Machine flights per flying accident ... ... ... | 1,319 |
| Machine hours per flying accident... ... ... ... | 424 |
| Passengers killed per 1,000 carried ... ... ... | 0.10 |
| Passengers injured per 1,000 carried ... ... ... | 0.15 |

[It is gratifying to note that though the Aviation Industry in Great Britain has temporarily fallen on evil days there is a satisfactory increase in the amount of useful work done. The casualties are proportionately no higher and the number of accidents has actually decreased. It is of interest to note that the average duration of each flight has increased over 25 per cent.—W. E. DE B. W.]

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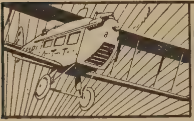
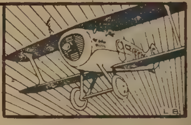


# COMMERCIAL AERONAUTICS
## AND CIVIL AERIAL TRANSPORT.



## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M): next the number of passengers: and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G.E.A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

**FEBRUARY 14th:**

M.A., Breguet, F-CMAH, London-Paris, 12.20-14.40, G.&M., Nil, Challoux
H.P.T., DH9, G-EAUI, Paris-London, 12.40-15.32, Nil, 2, MacIntosh.
G.E.A., "Goliath," F-GEAD, Paris-London, 12.50-16.10, G.&M., 2, Labouchere & 1.
S.N.E.T.A., DH4, O-BADO, Brussels-London, 13.10-15.43, G.&M., Nil, Van Opstal.

**FEBRUARY 15th:**

S.N.E.T.A., DH9, O-BELG, London-Brussels, 12.58-14.55, G.&M., Nil, Delzenne.
S.N.E.T.A., DH4, O-BADO, London-Brussels, 13.11-15.00, G., 2, Van Opstal
M.A., Breguet, F-CMAF, Paris-London, 12.40-16.38, G.&M., 3, Le Men.
M.A., Breguet, F-CMAC, Paris-London, 12.45-16.39, G., 2, Le Sec.

**FEBRUARY 16th:**

M.A., Breguet, F-CMAC, London-Paris, 12.15-14.47, Nil, Nil, Le Sec.
M.A., Breguet, F-CMAF, London-Paris, 12.10-14.47, G.&M., 2, Le Men.
G.E.A., "Goliath," F-GEAD, London-Paris, 12.15-14.35, G., 1, Labouchere & 1.
G.E.A., "Goliath," F-GEAC, Paris-London, 12.40-15.51, G., 2, Favreau & 1

**FEBRUARY 17th:**

M.A., Breguet, F-CMAH, Paris-London, 12.30-15.35, G.&M., 1, Le Men.

**FEBRUARY 18th:**

M.A., Spad, F-CMAY, Paris-London, 12.30-14.54, M., 1, Le Sec.
M.A., Breguet, F-CMAC, Paris-London, 12 37-11.05/19, G., 1, Challoux.
S.N.E.T.A., DH4, O-BARI, Brussels-London, 12.20-14.53, G.&M., 1, Delzenne.

**FEBRUARY 19th:**

G.E.A., "Goliath," F-GEAC, London-Paris, 12.30-15 15, G., Nil, Favreau & 1.
S.N.E.T.A., DH4, O-BARI, London-Brussels, 12.39-15.25, G.&M., Nil, Delzenne.
M.A., Spad, F-CMAY, London-Paris, 12.40-14.53, G.&M., 1, Le Sec.
M.A., Breguet, F-CMAH, London-Paris, 12.56-16.00, G., 1, Le Men.

**FEBRUARY 20th:**

NIL.

### The Air Port of Cricklewood. (Telephone: Hampstead 7500.)

**FEBRUARY 14th:**

H.P.T., SE-5, G-EATE, Paris-London, 12.40-16.27, Nil, Nil, ——

**FEBRUARY 15th:**

H.P.T., DH9, G-EAUI, London-Paris, 13.05-15.34, G.&M., 2, ——

**FEBRUARY 16th:**

H.P.T., DH9, G-EAUI, Paris-London, 12.30-15.15, G., Nil, ——

**FEBRUARY 17th:**

H.P.T., DH9, G-EATA, London-Paris, 12.17 (returned owing to weather), G.&M., Nil, ——

**FEBRUARY 18th:**

H.P.T., O/400, G-EATK, London-Paris, 12.15-15.10, G.&M., 5, ——
H.P.T., DH9, G-EATA, London-Brussels, 12.20-14.50, G., 2, ——

**FEBRUARY 19th:**

H.P.T., O/400, G-EATK, Paris-London, 13.10-16.00, G.&M., 1, ——
H.P.T., DH9, G-EATA, Brussels-London, 12.20-14.22, M., Nil, ——

**FEBRUARY 20th:**

NIL.

### Air Port Statistics.

CONTINENTAL

| | | | |
|---|---|---|---|
| MACHINES: | | | |
| | Croydon 21 | Cricklewood 8 | Total 29 |
| PERSONNEL.—Passengers: | | | |
| | Croydon 22 | Cricklewood 10 | Total 32 |
| Crews: | | | |
| | Croydon 25 | Cricklewood 10 | Total 35 |
| | | | Total Personnel 67 |

### Inland Flying at Croydon.

Feb. 14th.—H.P.T., DH9 to Cricklewood (MacIntosh).
Feb. 15th.—M.W.T.C., DH6, Wireless test (Lovell).
Feb. 16th.—L.A.S., Avro Leatherhead return (Muir).
Feb. 17th.—M.W.T.C., DH6, test (Lovell); I.A.L., "Vimy" joy-ride (Barnard).
Feb. 18th.—Nil.
Feb. 19th.—L.A.S. Avro Leatherhead return and joy-riding (Muir); I.A.L. "Vimy" joy-riding (Barnard).
Feb. 20th.—L.A.S. Avro Leatherhead return and joy-riding (Muir); I.A.L. "Vimy" joy-riding (Barnard).

### The London Terminal Aerodrome.

It is expected that the new landing lights will very soon be in operation. Meanwhile the lighting of upsticking obstacles round the aerodrome is completed, giving an effect at night similar to that of the bandstand on the sea front at Eastbourne.

The chief flying event of the week was a sham fight on Sunday between Mr. Barnard on the Instone "Vimy" and Mr. Muir on Mr. Chapman's Avro. The "Vimy," which had several passengers on board, is some twenty miles an hour faster than the Avro, but the latter is of course more easily manœuvrable in a scrap. Nevertheless the way Mr. Barnard threw her about and managed to stick on Mr. Muir's tail was quite extraordinary.

Mr. Muir took as his gunner Mr. Rupert Waring, late of 54 Squadron (who incidentally tells me that he has *not* at the moment yet obtained a title in connection with aviation).

More than a thousand people arrived to watch the flying from the free enclosure and the roads all round were thronged, yet comparatively few had 10s. joy-rides, which are now the order of the day. Had these been going for 5s. each, as before Christmas, one does not doubt for a minute that at least 500 trips would have been booked, with considerable profit to the firms in question. On a much less fine Sunday previously, with far fewer people about, 500 people were carried in the "Vimy" in one afternoon.

One believes that these cheap trips were suspended partly owing to objections raised by insurance companies and partly due to "dud" weather, but it is earnestly to be hoped, for the good of aviation and the firms themselves, that these will be restarted. It is obviously a more paying proposition to have 20 passengers at 5s. in the "Vimy" than only six or seven at 10s. Besides, people do not mind, even in these hard times, taking a couple of half-crowns from their pocket, but they think twice before going to their note-case.

On Thursday Mr. Barnard made a flight in the "Vimy" which caused people to leave their tea and their offices to come and watch. He was also carrying passengers on Wednesday and Saturday, as also was Mr. Muir. Mr. Muir also took a lady (Miss Brewtey) to Hampton Court from Leatherhead during the week.

A new joy-riding concern, with headquarters at Croydon, called the Surrey Aviation Company, is about to commence work with three three-seater Avros.—G. D.

### A New Bristol.

A new load-carrying triplane called the "Tramp" is nearing completion at the Bristol Aeroplane Co.'s works at Filton. It has two cargo holds, each cube-shaped, with 11-ft. sides. It is fitted with four Siddeley "Puma" engines in a central engine room, and is being built for the Air Ministry. It is constructed on the same lines roughly as the "Braemar."

Some highly interesting experiments are also being carried out with the "Babe," now a monoplane and fitted with a curious form of wing.

(*Continued on page* 192.)

# NAPIER

## Aero Engines

**The 450 h.p. Napier has proved itself the most satisfactory aero engine in the World for Economy, Reliability and Speed.**

**The Highest Prize in each of the three classes of the Government Aircraft Competitions — open to all British aircraft and engines — was awarded to Napier engined machines.**

**In the Government type test — which the Napier successfully passed — for one hour the engine developed the remarkable h.p. of 531.**

¶ Further proof of the excellent workmanship of all Napier productions was given when the 1000 h.p. Napier aero engine on its first bench test developed 1057 b.h.p.

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## For all K.L.G. Plug Users

In order to introduce the new "G" Detachable Type K.L.G. Plug, and to further popularise the famous K.L.G. Plugs, Messrs. Smith & Sons (M.A.) Ltd. are offering to all purchasers of K.L.G. Sparking Plugs during the period **FEBRUARY 21st to MARCH 7th inclusive,** the opportunity of competing for the following Prizes:—

| | | VALUE |
|---|---|---|
| **First Prize:** | 1921 MODEL 8-h.p. **ROVER CAR** | **£300** |
| **Second Prize:** | 1921 MODEL, Type H. 4-h.p. Roadster **TRIUMPH MOTOR CYCLE** with Sturmey-Archer 3-speed Countershaft Gear | **£127 10s.** |
| **Third Prize:** | 1921 MODEL 2¼-h.p. **ENFIELD TWO STROKE LIGHT-WEIGHT MOTOR CYCLE,** | **£65 0s.** |
| **Six Prizes:** | **EACH A SMITH BEZEL-WIND MANTEL-PIECE CLOCK IN MAHOGANY or OAK,** | **£6 10s.** |

**Fifty Consolation Prizes each being a useful Motor Accessory of the value of £1 1s.**

K.L.G. Plug Model G
*New Detachable Model suitable for all cars.*
**Price 6/- each**

## TO COMPETE FOR THE PRIZES

## Purchase a K.L.G. Sparking Plug

**(WITH COMPETITION COUPON)**

from your Local Dealer, or failing him, direct from S. Smith & Sons (M.A.) Ltd., 179-185, Great Portland Street, London, W.1. Be sure that the Plug Box contains a Coupon; on this you are asked to estimate the number of K.L.G. Plugs sold by S. Smith & Sons (M.A.) Ltd., during the period February 21st to March 7th, 1921, inclusive. All coupons must be posted to K.L.G. Plug Competition, S. Smith & Sons (M.A.) Ltd., 179-185, Great Portland Street, London, W., not later that March 7th. The First Prize will be allotted to the correct or nearest estimate, and all other prizes in rotation. In the event of two or more persons estimating the nearest number, the first coupon received by S. Smith & Sons (M.A.) Ltd. will be entitled to the First Prize. The results will be certified by an independent firm of Chartered Accountants, and will be published in the daily press on March 24.

**The Famous F7 Model K.L.G. is a super Plug for Motor Cycles, 10/6 each**
**K.L.G. Plugs, Standard R Models suitable for general use 5/- „**
(non-detachable)

*K.L.G. Plug Model S2*
*Popular Ford Model*
**Price 5/- each**

To ensure you getting the correct type of Plug, all you need do is to mention the name of your car, the horse-power and the year of make.

**Manufacturers of K.L.G. Plugs: The Robinhood Engineering Works, Ltd., Putney.**

## ORDER FORM

***Please forward K.L.G. Competition Plugs as follows:—***

***Quantity*** ........ ***Model No.*** ........ ***My Car is*** ........ ***Horse Power*** ........ ***Year of make*** ........

***Name & Address*** ........

***Dealer's Name & Address*** ........

Hand this order to your Local Dealer. If he cannot execute your order, post it direct (mentioning your Dealer's name) with your remittance to:—

**K.L.G. PLUG COMPETITION**

**S. SMITH & SONS (M.A.) LTD.**

**94, SPEEDOMETER HOUSE, GREAT PORTLAND STREET, LONDON, W.1**

# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

The control exercised over Civilian Aviation by the Air Ministry is regarded in certain quarters as being an abnormal phenomenon, based upon fundamental differences between aircraft and other types of vehicle. The error of this attitude is discussed in an article below.

Mr. Handley Page's lecture to the Royal Aeronautical Society describing the development of the Handley Page Wing is reported in abstract in this issue.

A new Dutch commercial machine of Teutonic origin, and a large American transport aeroplane, are described on pages 186 and 188.

Some particulars of a competition for designs for ship-planes promoted by the U.S. Navy are given in this issue. The specification laid down indicates that the U.S. naval authorities are fully alive to the drawbacks of the existing types of aircraft used for ship-board work.

## THE AIR MINISTRY AND GOVERNMENT CONTROL OF AVIATION.

At the meeting of the Royal Aeronautical Society which was held on the afternoon of Feb. 3rd, two papers dealing with subjects apparently very widely separated were read and discussed.

### THE USES OF METEOROLOGY.

The first of these dealt with meteorology in the service of aviation. Major G. Dobson, the author, was actively engaged in the investigations into the meteorology of the upper air which were carried out at Farnborough prior to the war with a specific view to obtaining information of special value for aeronautical purposes.

His paper dealt entirely with the possible methods of supplying the type of information required for the operation of air transport services, and the probable accuracy which could be obtained in forecasting for this purpose. The conclusions arrived at are that in practice owing mainly to the high cost of setting up sufficient upper air stations to allow a reasonable chance of accurate forecasting it will be more effective to develop rapid notifications of observed conditions along the actual routes in service.

With kite-balloon stations making observations every two or three hours, the stations being spaced between 150 and 200 miles apart, and so always within 100 miles of any part of a flight route, the probable error in the prediction of wind at any time would be about 7 m.p.h., and the maximum error would be under 12 m.p.h. in nine cases out of ten.

In regard to low clouds, Major Dobson said that little had been done towards forecasting the formation of clouds reaching to the ground. It should be possible to give warning of their probable formation. Physically speaking, it was possible to dissipate fogs over limited areas, but in practice it would be costly

Statistical information as to the weather conditions likely to be encountered over any route, or at any aerodrome, was solely matter of expending time and money. Statistics were dry, and were not discussed at any length.

### THE FUNCTIONS OF GROUND ENGINEERS.

The second paper of the evening dealt with the functions of ground engineers, their choice, supervision, and importance, and was read by Lt.-Col. H. W. S. Outram. This paper was divided into four parts, describing the causes which lead to the production of the species; the methods adopted for examining candidates; the classification of successful candidates into categories; and the ways in which the work of active ground engineers are supervised by the Air Ministry.

Some account of the duties which fall to the lot of ground engineers was included in the last section.

### THE CONNECTING LINK.

The connecting link between these two papers lies in the fact that both deal with the activities of the Department of Civil Aviation, and both papers raise in some measure the question of the extent to which Government control of Civil Aviation is likely to extend.

At the present moment the Department of Civil Aviation occupies a somewhat anomalous position which renders it particularly open to suspicion of an attempt to control civil aviation in interests other than those of civil aviation itself. The fact that it is an appendage to the Ministry responsible for the administration of the Royal Air Force is in many ways a disadvantage. It has rendered simpler the effort which is now being made in certain quarters to secure the artificial development of aerial traffic as an alternative to the provision of an adequate Air Force. This policy would tend to discourage the sound development of commercial air transport, would encourage the general public's lack of confidence in the commercial possibilities of aircraft, and the possibility that such a policy may be adopted renders every legitimate activity of the Department of Civil Aviation open to the suspicion that it is dictated by ulterior motives.

### THE EXIGENCIES OF THE MOMENT.

Nevertheless the conditions of the moment render it impracticable to place the Department of Civil Aviation under any Ministry other than that to which it is now attached.

Aerial navigation has reached the stage of development which renders commercial air transport possible under the control of that Ministry, and the formation of a Department attached to any other Ministry for the regulation of aerial traffic, for the licensing of machines and of personnel would have been attended by grave difficulties as to the provision of a staff, and by immense possibilities of friction between the new body and the Air Ministry.

Further it would have been impracticable for the Air Ministry to surrender its control over Government aerodromes to an independent body. The dues which can at present be collected from the Air Lines for the use of these aerodromes are hopelessly inadequate for their maintenance. But these aerodromes must be maintained against the possible needs of the Air Force in emergency, and the revenue from civil users may be regarded as effectively reducing the Air Force estimates.

For such a cost to appear in the estimates of a purely civilian Ministry would be to invite a campaign for economy by deleting the aerodromes.

### THE POSSIBILITIES OF THE FUTURE.

With the growth of aerial traffic these aerodromes will become self-supporting on the landing and other dues received from civilian users. Then the Air Ministry may safely cede the administration thereof to a purely Civilian Ministry, or even to local air port authorities, without fear that they will be built over by the time the Air Force again needs them for military purposes.

By that time the insurance companies in their own interests will have recognised systems of classification for aircraft, and aircraft will all be built to the rules of an aerial Lloyd's Register, under the supervision of the insurance companies' inspectors, and the Government Airworthiness Certificate standard will be a minimum to which no owner will wish his craft to sink.

There will then be ample numbers of fully qualified aeronautical engineers, and the problem of staffing a department of the Board of Trade to fulfil for aircraft the duties now discharged by the Marine Department of that body in respect to the mercantile marine will be fairly simple.

The Aircraft Industry will be able to support an adequate meteorological service, and, instead of the Air Force finding it necessary to maintain such a service for its own uses, and granting the benefits thereof to civilian aircraft, it will be possible to reverse the situation, and for the Air Force to rely, even in times of war, upon a meteorological office which has been developed in time of peace to meet the needs of commercial transport.

### THE PREVALENT BOGEY.

In the discussion upon the two papers to which reference has already been made, the bogey of Government control was raised in more than one form.

General Brancker referred to a fear that Government weather officers might attempt to forbid flights in weather which they considered unsuitable. The paper by Col. Outram on ground engineers touched more directly upon the matter. In some part Col. Outram must accept responsibility for having raised a quite unnecessary distinction between aircraft and other types of vehicle. Discussing the origin of ground engineers, he said:—

> "It may be well to consider at this stage why the creation of a new class of official was necessary. Every form of public transport is under some measure of Government control. The railways, although their vehicles operate only on their own property, have to conform to Board of Trade Regulations. Public transport services using the seas, the highways, and the rivers are under a larger measure of control in that not only are the members of the public who travel thereon safeguarded, but also the safety and convenience of other users.
>
> "The case of aircraft, while similar in many respects, differs fundamentally in that any other form of public service vehicle on land or sea once built in accordance with prescribed conditions and operated under certain limiting regulations, only loses its measure of safety through accident, or by a slow process of deterioration which can easily be detected by its behaviour and checked by occasional external examination. It is possible by the examination of the design of any aircraft to forecast its behaviour in the air, and comparatively easy by careful and detailed inspection to ensure that it is built in accordance with such design and of the required materials. As a result we can certify that the completed aircraft is airworthy, and guarantee that no undue risk will be taken by its passengers or caused to that section of the community over which it passes in its various flights. At the first landing some small damage may be done to some important part of the structure; during the first flight some part of the controls may wear, or a single but vital nut loosen, and in consequence, the aircraft, although landing safely, without any outward indication of the trouble, may within a few hours of the issue of the certificate of airworthiness have passed into a dangerous condition. In other words, a certificate of airworthiness is valid only until the aircraft takes the air, and its validity must be maintained by repeated examination, to prove that everything is in the same condition as when the certificate was first granted.
>
> "The ground engineer has been appointed to carry out these examinations."

### A DIFFERENCE WHICH IS *not* FUNDAMENTAL.

There is in fact no such fundamental difference between aircraft and other vehicles as is here suggested.

It is perfectly true to say that it is possible by the examination of the design of any locomotive to forecast its behaviour on a railway, and comparatively easy by careful inspection to ensure that it is built in accordance with such design and of the required materials, and to certify that it is railworthy. It is equally true to state that after the first run of that locomotive some small damage may be done to an important part of the structure—a single but vital nut may loosen, some part of the mechanism may have received dangerous wear, and as a result the locomotive may be no longer railworthy.

The difference between the two cases is far from fundamental; it is solely one of the degree of risk incurred, and this again is practically entirely a difference between the stage of development attained by the arts of railway engineering and of aeronautical engineering respectively.

### SOME RAILWAY POSSIBILITIES.

Any competent locomotive designer could to-day produce a locomotive—to outward seeming up to all standard requirements—which could be guaranteed to derail with fatal results the first time it took an express train over certain railway routes at ordinary schedule speeds.

Most existing locomotives could produce a really good smash provided they were allowed to start on a long-distance high-speed run if a small number of important nuts were unlocked and lightly slacked off.

Why is there not a "Load Factor Committee" for the guidance of locomotive designers, a Board of Trade "Railworthiness Certificate" for civil railcraft, and a system of compulsory licences for locomotive inspectors?

Because the art of railroad engineering is in a highly developed state, because any experienced loco designer can produce safe locomotives, and any capable railway manager can secure proper supervision of rolling stock and track, using such labour as the market offers.

Further because it pays railway companies not to have accidents, and therefore to maintain competent technical staffs, because all the members of the staff of any railway are legally responsible for the result of negligence in the discharge of their duties, and ultimately the railway company itself is responsible for the competence of that staff.

### A RUDIMENTARY ART.

The reason for a special treatment of civilian aircraft is that commercial aviation is in a rudimentary stage of its development. There is not as yet any certainty that left to itself each and every aerial transport concern could afford the technical staff necessary to ensure that it used only aircraft of safe design and construction. A minimum obligatory standard of safety must therefore be set and enforced by a public technical staff for the protection of the public. Further, lacking such a technical staff of its own, no company has the ability to determine, otherwise than by experience, what constitutes a competent maintenance staff. Therefore a minimum standard of competence must be set, and the employment of at least one official of this standard must be enforced upon all companies operating aircraft commercially, also in the interests of the public safety.

In practice the Board of Trade requires that all British merchant ships shall comply with certain minimal requirements of safety and shall be operated by competent officers. Were these requirements made by the Admiralty there might be some risk of their being directed by other considerations than those of the public safety.

### AN APPARENT DILEMMA.

In the case of ground engineers an objection has been raised on the ground that their position is an impossible one, in that their interests as employees of an aerial transport company may induce them to allow machines to fly when their duties according to the instructions of the Air Ministry would lead them to insist on repairs being carried out before a flight took place.

This apparent dilemma is rendered more acute by the fact that in practice a ground engineer is usually considered in the light of a mere foreman of mechanics, whereas the scope of his responsibilities, as laid down by the Air Ministry, and certainly as described by Col. Outram, appears to be such that an engineer of very high capacity would be needed for their efficient discharge.

Actually the Air Ministry has already discovered that all the qualities needed for a fully qualified ground engineer are rarely combined in one individual of the class which existing Air transport firms can afford to employ for these duties, and they have been forced to face the facts by granting to such men as are available, licences which permit their holders to exercise the duties of a ground engineer within very narrow limitations.

### THE PRACTICAL VIEW.

In practice therefore the ground engineer regulations merely make it compulsory for each company to employ at least one man tolerably competent to judge of the condition of each of the already generally approved designs of aircraft and engines which that concern uses, and for that company to submit every machine to the inspection of that man, to secure from that man his certificate that he is satisfied as to its general fitness to fly before it is allowed to fly. Such a regulation can only be regarded as the least precaution which such a firm should take in its own interests.

The definition which the Air Ministry supplies by its examinations of what constitutes a reasonably competent man, and the specification of the frequency of examination and certification which will be considered sufficient, actually relieves the Air Transport companies of the onus of proving that they exercise due and sufficient care in the maintenance of the aircraft in use.

### A NORMAL POSITION.

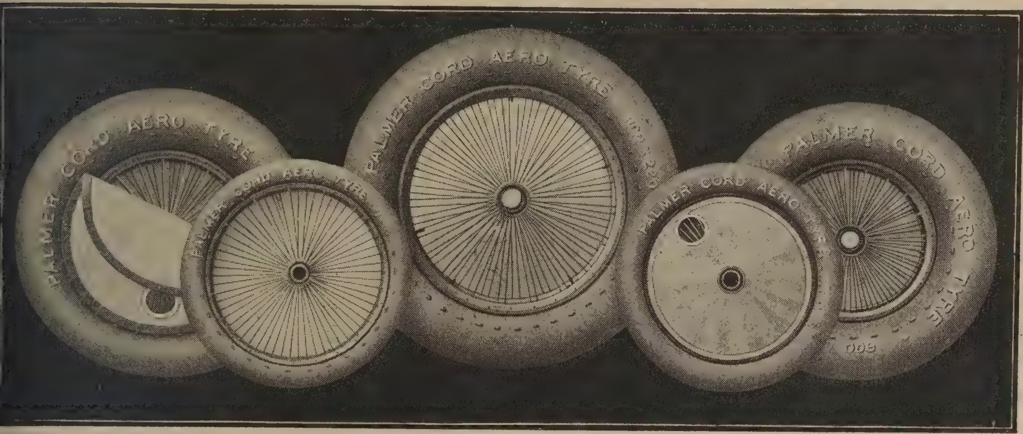
The position of the ground engineer is in no sense anomalous. In no case can it be to the interests of any reputable transport concern to fail in the proper supervision of the vehicles they employ, and the ground engineer is in the position of any responsible employee of such a company who is charged with such supervisory duties. The Air Ministry regulations provide him with a definition of the minimum of his duties in this respect, and give to him protection from any legal responsibility for failure therein, provided he can show that he has complied with these regulations.

The weak point in the whole scheme of airworthiness certificates and ground engineer regulations is really a weak point in the Air Transport Industry.

When aircraft rank in importance as transport facilities with motor-buses no Air Transport company will be content with the Government minimum requirements as to safety of

# PALMER

# LANDING WHEELS & TYRES



## STANDARD SIZES

| Tyre Sizes | Wheel No. | Hub | | Track Line |
|---|---|---|---|---|
| | | Length | Bore | |
| | | m/m | m/m | m/m |
| 300×60 | 16 | 111.12 | 25.4 | Central |
| ,, | 17 | 72.39 | 12.7 | Central |
| 450×60 | 30 | 89. | 31.75 | Central |
| ,, | 131 | 130. | 38.09 | Central |
| 575×60 | 21 | 160. | 28. | Central |
| ,, | 34 | 150. | 31.75 | 104/46 |
| ,, | 111 | 150. | 38.09 | 104/46 |
| 650×65 | 78 | 178. | 44.45 | 132/46 |
| ,, | 79 | 178. | 44.45 | Central |
| ,, | 100 | 178. | 38.09 | 132/46 |
| ,, | 101 | 178. | 31.75 | 132/46 |
| 600×75 | 21 | 160. | 28. | Central |
| ,, | 34 | 150. | 31.75 | 104/46 |
| ,, | 111 | 150. | 38.09 | 104/46 |
| 700×75 | 78 | 178. | 44.45 | 132/46 |
| ,, | 79 | 178. | 44.45 | Central |
| ,, | 100 | 178. | 38.09 | 132/46 |
| ,, | 101 | 178. | 31.75 | 132/46 |
| 700×100 | 77 | 178. | 44.45 | 132/46 |
| ,, | 92 | 185. | 55. | 135/50 |
| ,, | 95 | 185. | 55. | Central |
| ,, | 96 | 178. | 55. | 132/46 |
| ,, | 99 | 178. | 38.89 | 132/46 |
| ,, | 112 | 150. | 38.09 | Central |
| 650×125 | 119 | 178. | 55. | 132/46 |
| 750×125 | 77 | 178. | 44.45 | 132/46 |
| ,, | 92 | 185. | 55. | 135/50 |
| ,, | 95 | 185. | 55. | Central |
| ,, | 96 | 178. | 55. | 132/46 |
| ,, | 99 | 178. | 38.89 | 132/46 |
| ,, | 112 | 150. | 38.09 | Central |
| 800×150 | 82 | 185. | 55. | 135/50 |
| ,, | 85 | 185. | 55. | Central |
| ,, | *36 | 185. | 55. | 135/50 |
| ,, | *40 | 185. | 60.32 | 135/50 |
| ,, | 152 | 185. | 66.67 | 135/50 |
| 1000×150 | 131 | 220. | 66.67 | Central |
| ,, | 102 | 185. | 55. | 125/60 |
| 1000×150 | 141 | 250. | 80. | Central |
| ,, | 201 | 185. | 60.32 | 125/60 |
| ,, | 209 | 185. | 55. | Central |
| ,, | 210 | 185. | 60.32 | Central |
| 1000×180 | 148 | 220. | 80. | Central |
| ,, | 149 | 185. | 55. | Central |
| 900×200 | 107 | 185. | 55. | Central |
| ,, | 108 | 185. | 55. | 125/60 |
| ,, | 128 | 220. | 66.67 | Central |
| ,, | 137 | 250. | 80. | Central |
| ,, | 202 | 185. | 60.32 | Central |
| 1100×220 | 134 | 220. | 66.67 | Central |
| ,, | 136 | 250. | 80. | Central |
| 1250×250 | 133 | 250. | 80. | Central |
| 1500×300 | 115 | 304.8 | 101.6 | Central |
| ,, | 126 | 304.8 | 152.4 | Central |
| 1750×300 | 139 | 400. | 152.4 | Central |

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design. They will have to comply with the more stringent rules of the insurance companies to obtain low insurance rates.

They will employ competent aeronautical engineers, who will know more about the necessary load factors for safe working than any Load Factor Sub-Committee of the Committee for Aeronautical research, and their supervisory officials will be responsible not for the observance of a minimum ritual of supervision, but in the fullest sense for the due and proper maintenance of the aircraft in their charge in a safe and airworthy condition. Their responsibilities will be not less, but immensely greater than those of the present ground engineer.

The Department of Civil Aviation will then be able to retire to the Board of Trade, or the Ministry of Transport, its activities can become more general and less grandmotherly, and the suspicion that regulations intended to secure public safety are being used to other ends should vanish.

In the meantime that Department is doing its best. Like the pianist of the story, its execution may be execrable, its instruments appallingly out of tune, but it really does not yet deserve to be shot.

It is faced with the task of stimulating the civilian use of aircraft, and of securing that such use shall be compatible with a reasonable degree of safety at a time when nobody knows with any certainty what civil functions aircraft are capable of discharging efficiently, or what measure are essential to secure the necessary degree of safety. It is compelled by force of circumstances to discharge its duties as best it may under the ægis of a Ministry whose true functions and proper interests are widely divergent from its own, and under the circumstances it is idle to wonder that it makes mistakes. It is permissible to express astonishment that it has made so few. —W. H. S.

## THE HANDLEY PAGE WING.

The lecture given by Mr. F. Handley Page on the afternoon of Feb. 17th before the Royal Aeronautical Society was a record of the experimental results achieved in the development of this wing from the earliest stages to the present time.

Referring to a paper given by himself before the same Society in 1911 the author reproduced certain figures shown at that date which proved that a wing of low aspect ratio had a higher critical angle and a higher lift coefficient than a wing of high aspect ratio.

It was assumed that this fact was due to air passing in over the ends of the wing of low aspect ratio and preventing the formation of the dead air region above the wing and the consequent turbulence.

Experiments were therefore made with a wing of 6¼ aspect ratio, divided up by five slots parallel to the chord into six squares. This gave an increased stalling angle and a slightly inreased lift.

Better results were obtained with this type of slot, but the experiments with transverse slots gave more promising results and the first type was abandoned.

The first such slot was tested on a R.A.F.15 section and numerous experiments were made with slots of various shapes and with differing sizes of the openings, shapes of the aerofoil, etc.

On quite early tests on an aerofoil of R.A.F.6 section an increase of the maximum lift coefficient of 25 per cent. was obtained, and a later test on aerofoil No. 32, of every similar shape to that of R.A.F.6, tested at the N.P.L. gave a maximum lift coefficient of 0.943 with the slot open as against 0.633 with the slot closed. The best values of L/D were 14.1 and 16.6, open and closed respectively. Plotting the results of these tests on a speed power basis shows that the landing speed was reduced by 20 per cent. by the opened slot.

Pressure distribution measurements showed that the distribution over the small leading aerofoil and the main aerofoil were of the same nature as those in an ordinary aerofoil, and that "burbling" occurred on the small aerofoil when it reached its own critical angle. It seemed probable that this could be prevented by putting yet another auxiliary aerofoil ahead of it, and tests were therefore made with more than one slot—the total number ranging up to seven.

Tests on thick high-lift wings showed that they behaved exactly as had the high-speed type of wings, and tests on R.A.F.19 gave with six slots a lift coefficient of 1.96 at an incidence of 45 deg. and with the trailing edge of that wing vertical.

All these tests were monoplane tests at 40 ft. per second, but biplane tests since made showed that the biplane corrections necessary were similar to those for unslotted wings.

Tests of the centre of pressure movement showed that the centre of pressure with open slots was always slightly behind that of the same wing with slots closed, but as opening the slot at small angles decreases the lift somewhat the C.P. for the same lift is scarcely changed. According to an N.P.L. report on a single-slot wing the longitudinal balance of a machine flying at 8 deg. with the slot closed would be approximately the same as when landing at 22 deg. with slot opened.

Further experiments has shown that the presence of the slot did not in any way interfere with the use of trailing-edge flaps—which would increase the lift coefficient if they were pulled down. Ailerons therefore could be relied on to function normally.

Pressure plotting results indicated that the cause of "burbling" was the rapid increase in negative pressure over the leading upper part of the aerofoil with increase in the angle of attack at angles near the stalling point, which at some point was accompanied by a very rapid drop in pressure in a region slightly farther back. This steep pressure gradient led to a discontinuity of flow and to eddying.

Discussing the effects of the slotted wing on design, Mr Handley Page said that the increased lift coefficient permitted either slower running speeds or alternatively of less power at top speed. The first was self-evident; the second required explanation. With the usual type of aerofoil the loading was determined by the maximum lift coefficient of the section and the allowable landing speed. The top speed then was determined by the weight per h.p. and the characteristics of the machine. In practice this top speed was always associated with a smaller incidence than that of best L/D.

With the slotted plane the top speed could be made to occur at the best value of L/D, and then the slow speed could be adjusted by fitting the necessary number of slots to give the needed maximum lift.

Calculations indicated that it was possible to give to a complete aeroplane a maximum L/D value of 15. This allowed of 120 m.p.h. with 33 lb. per h.p., and a suitably slotted wing would then allow sufficiently low speeds for landing.

There were numberless ways of arranging the slot opening and closing mechanism, and there need not be any excessive structure weight. The simple swinging leading edge (see The Aeroplane, p. 42, Jan. 12th, 1921) promised to be useful, but there was room for much practical experiment as to the exact construction. He hoped that many others would attack this side of the problem.

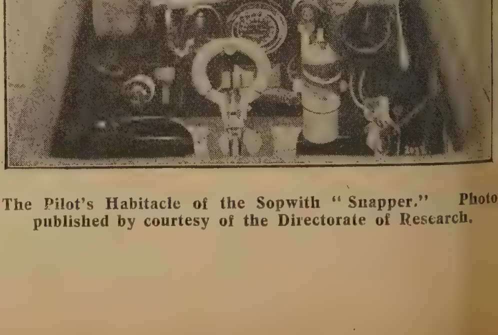
[Owing to the fact that this meeting occurred on Thursday evening and that this part of the paper goes to press on Friday it has been found impossible to give here more than an abstract of this important paper. A report of the discussion and reproductions of some of the figures illustrating the lecture will be printed in the next issue.—Ed.]

## THE AERONAUTICAL JOURNAL.

The issue of the journal of the Royal Aeronautical Society for February, in addition to the complete report of the meeting of Dec. 2nd, whereat the papers on "Airship Piloting," by Major G. H. Scott, and on "Airship Mooring and Handling," by Flt. Lt. F. L. C. Butcher, were read and discussed, contains a note on Free Wire mooring systems for airships, and the first instalment of a very interesting communication on the development of giant aircraft in Germany.

This communication, which is unsigned, deals with the general trend of this development and the special conditions which influenced it.

Readers of The Aeroplane who are not members of the Royal Aeronautical Society are reminded that copies of the *Aeronautical Journal* may be purchased from the Society's office, 7, Albemarle Street, for 2s. 9d. each (post free).



**The Pilot's Habitacle of the Sopwith "Snapper." Photo published by courtesy of the Directorate of Research.**

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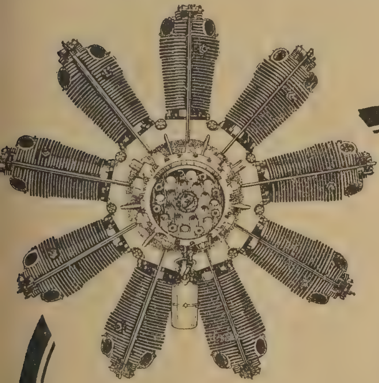

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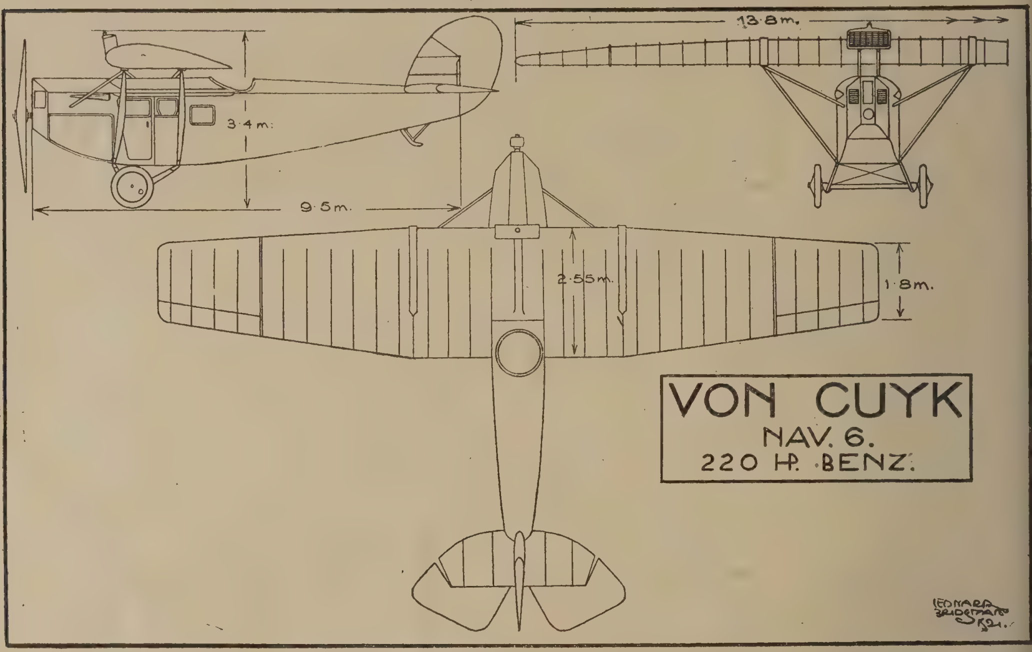
## A DUTCH PASSENGER CARRIER.



The attached illustrations show a four-passenger monoplane which has been built by the "Nederlandsche Automobiel un Vliegtnig Ordeneming" (Dutch Automobile and Aircraft Co.) of Maas, Holland.

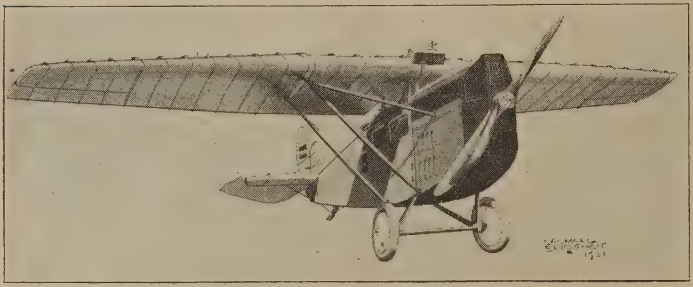
The machine is evidently based on the war monoplane designs of the German Kondor concern, the three-ply cantilever wing, with metal reinforcing strips, and the centra bracing tube arrangement being precisely similar to the original type.

The general arrangement of cabin and pilot's seat follow on the lines first laid down in the B.A.T. limousine and sinc followed by practically every designer of passenger machines

The machine is known as the Va Cuyk, a name whose exact incidence i unknown, but which may indicate tha the Kondor Flugzeugwerke—like mor than one other belligerent aircraft factory—had at least one Dutch designe on its staff.

The main particulars are given in the following specification :—

| | |
|---|---|
| Span | 18.8 m |
| Length over all | 9.5 m |
| Height over all | 3.4 m |
| Weight, empty | 1,100 kg |
| Weight, loaded | 1,750 kg |
| Wing area | 36 sq. m |
| Loading, per sq. m. | 57 kg |
| Load per h.p. | 8 kg |
| Engine | 220-h.p. Ben |
| Speed at 1,000 m. | 170 km.p.h |



## THE GLEN L. MARTIN TRANSPORT BIPLANE.

The Glenn L. Martin Co. of Cleveland, U.S.A., have recently produced a twin-engined biplane known as the "commercial transport." It is in effect a version of the original Glenn Martin "bomber," and the present model can be traced down through the subsequent machines, the "mail" type and the torpedo-carrier, it showing only slight alterations in design and construction so as to render it more suitable as a commercial machine, where economy of operation, upkeep, housing, and repair is essential.

The principal outward alterations from the mail-carrier noticeable in the latest design are : the engines have been mounted direct on the lower planes with a new system of strutting, the interplane struts are vertical, the undercarriage has been considerably simplified, and the wings fold. These modifications are common to the torpedo-carrier except that two separate two-wheeled undercarriages are fitted with a clear space in between to permit of the torpedo being dropped.

### Construction.

The fuselage is of the usual rectangular cross-section built up of four longerons, the forward section of which are of ash with the rear section of spruce, the join being in the form of a splice.

The forward section of the fuselage from the nose to the rear of the aft cargo compartment is covered with 3/32 in. three-ply birch, with plywood bulkheads. The cargo compartments are lined with plywood and are braced and reinforced to carry ordinary loads. The central compartment is fitted with a cradle and slings for carrying heavy concentrated loads.

From the rear of the cargo space aft the fuselage is braced in the ordinary way. The fuselage struts are of spruce and fit into sockets brazed to the longeron fittings, which are made of sheet metal and encircle the longeron, each fitting, with few exceptions, taking six bracing wires. The doors to the cargo compartments are below, as shown in the scale drawing.

The undercarriage consists of two nickel steel tubular axles, each fitted with one wheel, pivoted under the fuselage, the outer ends being carried in two nickel steel tube Vees placed one under each engine. The axle suspension is by rubber shock absorber. All undercarriage tubing is faired and fabric-

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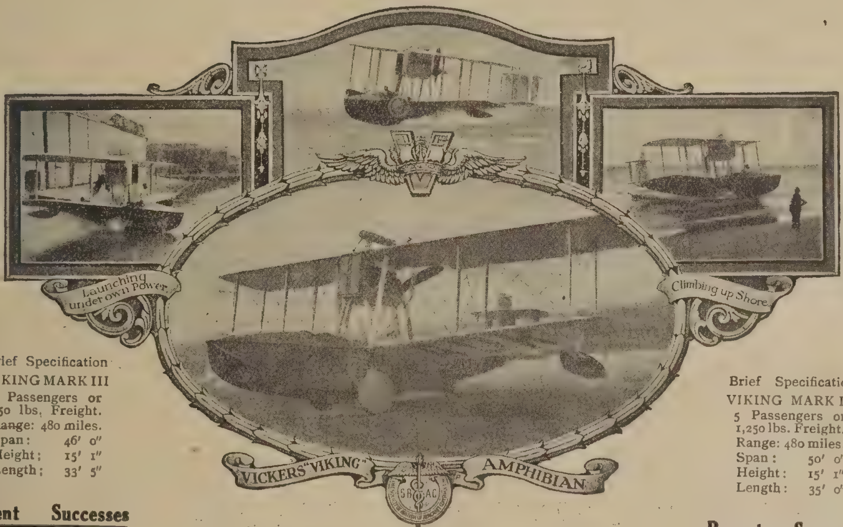

Brief Specification
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5 Passengers or
750 lbs. Freight.
Range: 480 miles.
Span: 46′ 0″
Height: 15′ 1″
Length: 33′ 5″

**Recent Successes**

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

1. **Shortest time in "unsticking" from water.**
2. **Fastest time over a given circuit.**
3. **Climb to 1,000 metres.**
4. **Altitude with full load.**

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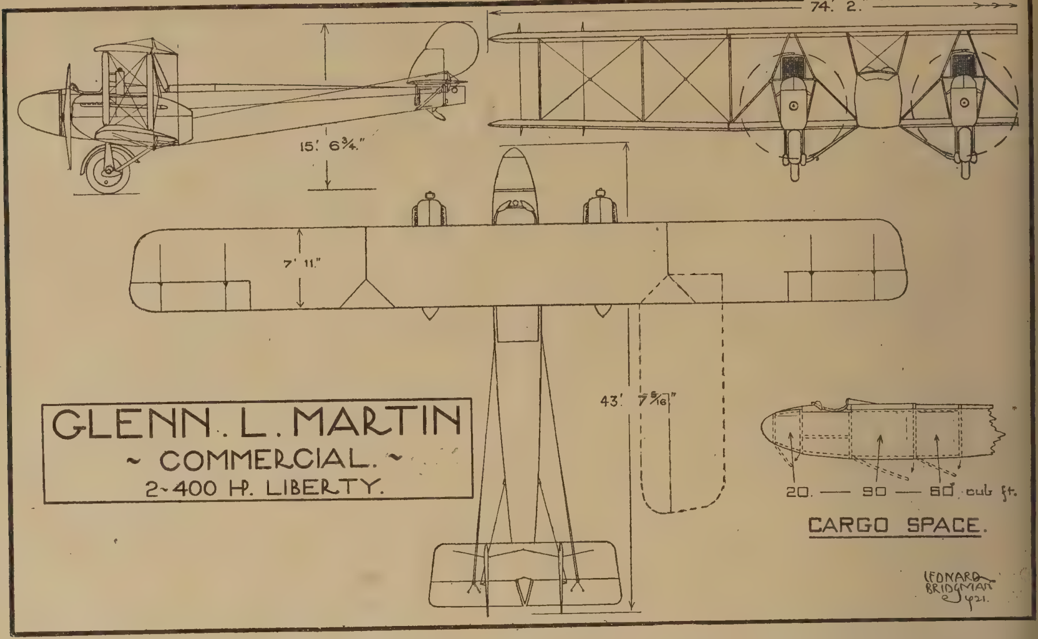


bound where possible; the shock absorber is enclosed in a streamline casing and mudguards are fitted to the wheels.

The wings follow standard construction throughout, and are built up of spruce spars and ribs. In the inner lower wing sections an auxiliary triangle of steel tubes inside the wings carries the stress in the lower wing spar from the engine nacelle to the body.

Interplane struts outside the wing hinges are of spruce, while the struts at the wing hinge are of steel tube faired with aluminium. The strut system round the engines consists of a triangulation of faired steel tubes connecting the engine nacelles to the fuselage, landing-gear and top plane.

The tail unit consists of tail plane, elevator, and two fins and rudders. The entire unit is mounted on top of the fuselage, from which it can be detached intact, and is braced with steel tubing and steel tie-rods or cables. All tail surface frames are of steel construction, and are fabric covered. The tail plane can be adjusted from 0 deg. to minus 4 deg. whilst in flight.

The engine nacelles carry each one 400-h.p. Liberty "12" in the forward half. The engine bed is built on the top of a vertical plywood bulkhead, braced laterally by a horizontal plywood bulkhead connecting it to the nacelle longerons. A sloping bulkhead connects the forward end of the engine-bearers to the front wing spar. The oil tanks are carried underneath the engines. The petrol tanks are carried in the rear of the engines, behind a fireproof bulkhead. The engine cowling is sheet aluminium throughout. The radiators are mounted above the nacelles directly above the fireproof bulkheads. Gravity tanks are carried one above each engine on the top plane, and are fitted with a sight-glass on the overflow line enabling the pilot to determine at all times whether petrol is being pumped to the gravity tanks. The engine controls are carried to the fuselage through the wings, and are of standard cable.

### Specification.

| | |
|---|---|
| Span | 74 ft. 2 in. |
| Height | 15 ft. 6¾ in. |
| Gap | 8 ft. 6 in. |
| Length | 43 ft. 7 5/16 in. |
| Chord | 7 ft. 11 in. |
| Area of planes | 1,121 sq. ft. |
| Area of elevator | 43 sq. ft. |
| Area of rudders (2) | 39.5 sq. ft. |
| Area of ailerons (4) | 130 sq. ft. |
| Area of tail plane | 62.25 sq. ft. |
| Area of fins (2) | 18 sq. ft. |
| Weight (empty) | 6,840 lb. |
| Cargo capacity | 3,000 lb. |
| Total weight (loaded) | 12,000 lb. |
| Useful load | 5,160 lb. |
| Weight per sq. ft. | 10.7 lb. |
| Engines | 2 400-h.p. Liberty |
| Weight per h.p. | 15 lb. |
| Speed (max.) | 110 m.p.h. |
| Speed (landing) | 52 m.p.h. |
| Speed (cruising) | 100 m.p.h. |
| Climb (fullv loaded) | 5,000 ft. in 10 min. |
| Ceiling | 13,000 ft. |
| Radins at cruising speed | 600 miles |

## THE INTER-ALLIED COMMISSION IN GERMANY.

The four-engined Zeppelin-Staaken monoplane of which so much has been heard has for some considerable time been a source of discomfort to the Inter-Allied Commission of Aeronautical Control.

This machine has been built with the full knowledge of the Commission, who, it is gathered, were given every opportunity to inspect the designs before the machine was laid down and asked to sanction it as a commercial type. The Commission, it is alleged, found themselves entirely without the necessary technical knowledge to decide from these drawings whether the machine when complete would be a purely commercial type or one capable of use for war purposes, and therefore refused a definite decision but permitted —it is believed even encouraged—the building of the machine.

The very excellent results given by the machine on tests have placed them in a quandary. For to condemn the machine to deletion as a war machine after having permitted its construction would have given the Germans an opportunity which would scarcely have been lost of misrepresenting the honesty of intention which characterises all Allied dealings with our late enemies. But, it is reported, by a stroke of genius the difficulty has been overcome and the reputation of the Allies for fair dealing has been maintained.

The Staaken monoplane is to remain in the hands of its constructors to be used as they will. But the four 260-h.p. Maybach engines fitted to it have been discovered to be—under the Treaty of Versailles—subject to seizure and deletion. They have been seized and deleted—and honour is satisfied.

## AIR MINISTRY NOTICES TO GROUND ENGINEERS.

No. 18, 1921.—INTERPLANE AND CENTRE-SECTION STRUTTS: ROTTING IN LOWER SOCKETS.

It is hereby notified:—1. In several instances recently it has been noted that the lower ends of wooden interplane and centre-section struts have rotted in the sockets, due to prolonged exposure of the aircraft to the weather under winter flying conditions.

2. *The attention of Ground Engineers is, therefore, directed to the necessity of a careful examination of this portion of all such struts.*

3. The tendency of the strut end to rot can be materially reduced by providing some arrangement to prevent water from entering the socket, thus obviating constant contact between moisture and the end grain of the strut.

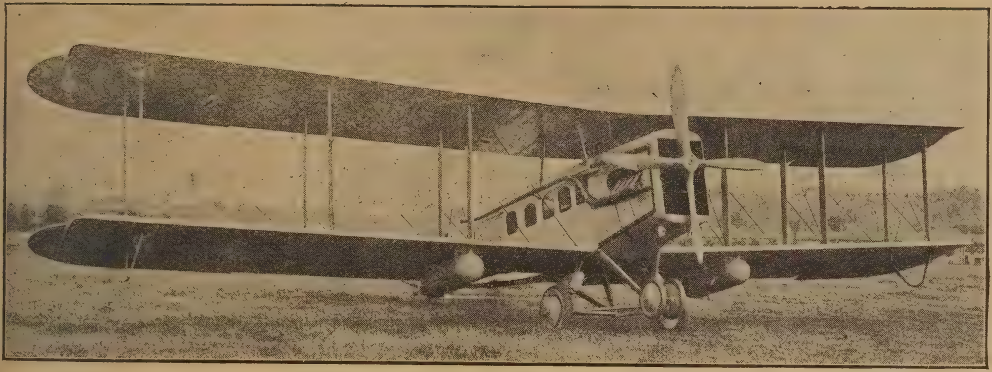
No. 19, 1921.—TOP OVERHAUL OF ENGINES AFTER STORAGE.

It is hereby notified:—All engines that have been in storage or unused in machines for more than three months since previous running, as recorded in the Log Book, should be subjected to top overhaul before being passed by the Ground Engineer for flight. The internal condition of the engine should be carefullyy examined for signs of corrosion, particular attention being paid to cylinder bores and all ball and roller bearings.

In addition to the usual precautions taken after top overhaul to ensure that all parts of the engine, including ignition and carburation systems, function correctly, special attention should be given to the flushing of all oilways—flushing, cleansing, adjustment, refilling, etc., of lubricators, filters, etc.

*Air Ministry*, Feb. 12th, 1921.

# WESTLAND



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## FROM AMERICA.

### A Competition for Ship-plane Designs.

The American Naval Authorities have recently issued an invitation to American aircraft designers to submit designs for shipplanes needed for naval purposes. The competition is open solely to American nationals.

All such designs are required to be submitted for preliminary examination by Feb. 15th, 1921, and any or all may be rejected without explanation. Any such designs as are given preliminary approval may be further developed before being submitted to a final examination. The Naval Authorities may if they think fit make suggestions or criticisms in this intermediate stage.

For the final examination fairly complete drawings and data are required, and the department will then finally approve or reject each design

The four best designs approved—if so many secure approval—will be purchased for 16,000 doll., 10,000 doll, 5,000 doll. and 3,000 doll. respectively. This payment entitles the Navy Department to use the design and the data and information furnished therewith in any manner they may desire.

In return the designer must supply corrected drawings and specifications sufficient for the construction of a sample machine. There is no undertaking that the order for the construction of any such machine will be entrusted to the designer.

The specification calls for a two-seater machine fitted with guns and wireless gear, designed for the control of gunfire, and to rise from and alight upon the deck of an aircraft-carrier.

In so far as getting off is concerned the machine must be designed to take off in not more than 150 ft. when the ship is steaming at a rate producing a wind speed of 20 knots relatively to the deck. In addition, it is to be designed to stand being catapulted from a standard naval catapult which gives an acceleration of 64.4 ft. per sec. and a terminal speed of 45 knots. On leaving the catapult the machine is to immediately begin climbing.

Arresting gears are to be provided on the deck for landing, but designers are to assume that the minimum air speed at contact with the deck is not to exceed 40 knots. The necessity for adequate control at this speed is emphasised.

In addition to these requirements the machine is required to be capable of alighting on the water and safely floating there in fairly rough water for some long period. It is desirable, but not essential, that the machine be able to rise from the water under its own power.

The conventional type of float seaplane is considered to give reasonably satisfactory results as regards these points, and any device or arrangement giving equal security in this respect will be favourably considered. Hydrovanes and inflatable air-bags are not considered satisfactory and such arrangements will not be accepted.

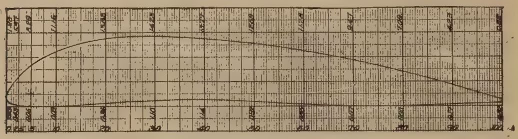
The importance of small overall dimensions, accessibility of all parts, and simplicity are insisted on. And folding or easy dismounting, combined with simplicity of re-erection, are called for.

There are no restrictions as to the engines to be used except that they must be engines now on the market and of a type approved by the Navy Department. Fuel for four hours is to be carried.

No performance specification is given, the highest possible speed, climb, and ceiling compatible with the other requirements are asked for.

### A New High-Lift Wing.

The Glenn L. Martin Company of Cleveland, Ohio, announce that they have developed a thick-section high-lift wing which combines a high value of maximum lift coefficient with a 10 per cent. to 15 per cent. greater efficiency at high speeds than that of any fixed aerofoil on record.



As the attached figure shows, this wing is in nowise remarkable in form, and the only clue to its value is the data given—that it will lift, in model form, 4.60 lb. per sq. ft. at 30 m.p.h. This gives a lift coefficient in the British non-dimensional units of 0.985—a high value for a straight model. But it is not—as claimed—twice as high as that of R.A.F.15, nor is it 25 per cent. greater than the Handley Page wing.

It is roughly half the maximum lift reached by any Handley Page aerofoil, and it is less than the effective lift coefficient reached on full-scale tests of high-lift wings in this country as far back as 1916.

### New Air Service Engine.

According to the Air Service News Letter dated Jan. 28th, 1921, the initial run of the new Engineering Division 700-h.p. Model "W" engine was made on Jan. 10th with very satisfactory results This engine was completely designed by the staff of the Engineering Division at McCook Field.

This engine is of the W type, having eighteen cylinders arranged in three banks of six, and develops more horse-power than any engine which has been built in the United States. The actual figures on the test have not been divulged, but are said to exceed the designers' expectations.

## AERIAL TRANSPORT AT THE EFFICIENCY EXHIBITION.

In connection with the Efficiency Exhibition now being held at Olympia a conference dealing with commercial aviation will be held on Feb. 25th, 11 a.m., at Olympia. At this conference Mr. H. White Smith, chairman of the S.B.A.C., is to read a paper dealing with the efficiency of air transport.

This paper has been designed to put before business-men a clear statement of the value to them of aerial transport as a method whereby business operations may be accelerated and consequently the profits thereof increased

## TRADE NOTES.

### E. J. Mitchell, of Palmers.

It was recorded last week that Mr. Parsons has succeeded Mr. Mitchell as general manager of the Palmer Tyre Ltd. Happily this does not mean that Mr. Mitchell is severing his connection with Palmer Tyres, for any dissociations between the Palmer Tyre and Mr. Mitchell is unthinkable, and undoubtedly if it happened it would be a shock from which nobody in the tyre trade would ever recover. Mr. E. J. Mitchell has in fact held the position of general manager of the Palmer Tyre business for quite 25 years and he is naturally proud of the fact that he has retained his position as administrative head of a leading tyre company for a much longer period than any of his contemporaries in the tyre trade when that trade first began. Consequently it is as difficult to think of Palmer without thinking of the name of Mitchell as it would be to think of the name of Mitchell without recalling Palmer Tyre.

One's personal recollection of Mr. Mitchell goes back to the year 1894 at least, when the Palmer tyre was comparatively a new importation from America, and one has particularly tender recollections of a set of extraordinarily fine racing bicycle tyres with which one was presented about that period by Mr. Mitchell, thus perhaps endangering one's amateur status. Seeing that this is a matter of 25 years ago it stands to reason that Mr. Mitchell is not a young man, but one confesses to being surprised to hear that he is in his sixtieth year. How he manages to retain his youthful appearance and energy after so many years of strenuous work is a mystery of which one wishes that one knew the secret. At any rate, his capacity for business is undoubtedly as great as it was a generation back.

Happily the tyre trade will not be deprived of his wisdom and experience, for he retains the seat on the Board of the Palmer Tyre Ltd. which he has held for many years, and one would not be surprised to hear that sooner or later he has become associated with some other branch of the motor industry, for certainly a mere single directorship could not afford an outlet for his energy nor could it confer on British trade as a whole the benefit which it should derive from his great ability.—C. G. G.

### Mr. Santoni's Move.

It is announced that Mr. D. Lawrence Santoni has severed his relations with the Societa Idrovolanti Alta Italia, of Sesto-Calende, the producers of the well-known "Savoia" flying-boats, and has now opened an industrial office with an aeronautical department at 72, rue de la Boétie, Paris. This office has representatives in every European capital, and Mr. Santoni will be glad to negotiate with British aircraft constructors who are desirous of introducing their products abroad.

Mr. D. Lawrence Santoni will be remembered in this country from 1910 onwards as the very active representative of such well-known foreign concerns as Deperdussin, Tellier, Anzani, Emaillite, etc., and the fact that at least two of these firms did so much for the British Air Services during the war speaks well for the good work done by Mr. Santoni in the lean pre-war days.

### New Sunbeam Showrooms.

On Monday, Feb. 14th, the new showrooms acquired by the Sunbeam Motor Car Co., Ltd., at 12, Princes Street, Hanover Square, were opened for business. The showroom on the ground floor is one of the largest one has ever seen, and the magnificent Sunbeam Cars were greatly admired by the large gathering who were so excellently and adequately entertained by the firm.—G. D.

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*"The most economical transport aeroplane yet in existence."*
*—Technical Press.*

SPECIFICATION AND PERFORMANCE.

**Engine—**
450 H.P. Napier "Lion."

**Main Dimensions—**

| | |
|---|---|
| Span | 50 ft. 6 ins. |
| Chord | 6 ft. 6 ins. |
| Overall Length | 38 ft. 10 ins. |
| Overall Height | 13 ft. 0 ins. |

**Capacity—**
8 passengers or 2,200 lbs. of freight in 255.75 cub. ft.
1 Pilot (NOTE—Cubic capacity for heavy loads only — 200 cub. ft.)
105 Gallons Petrol,
10 Gallons Oil.

| **Weights—** | With 8 Passengers. | With Freight |
|---|---|---|
| Machine empty with water | 4,040 lbs. | 3,880 lbs. |
| Crew | 180 lbs. | 180 lbs. |
| Useful Load | 1,440 lbs. | 2,200 lbs. |
| Petrol | 761 lbs. | 761 lbs. |
| Oil | 95 lbs. | 95 lbs. |
| Total Weight Fully Loaded | 6,516 lbs. | 7,116 lbs. |

**Loading—**

| | |
|---|---|
| W/HP. (with 6,516 lbs.) | 13.1 lbs. |
| W/HP. (with 7,116 lbs.) | 14.2 lbs. |
| Lbs./sq. ft. (with 6,516 lbs.) | 10.5 |
| Lbs./sq. ft. (with 7,116 lbs.) | 11.5 |

**Total Area of Main Planes—**
618 square feet.

| **Performance—** | With 8 Passengers. | With 2,200 lbs. Freight. |
|---|---|---|
| Speed at 1,000 ft. | 128 M.P.H. | 124 M.P.H. |
| Speed at 5,000 ft. | 125 M.P.H. | 121 M.P.H. |
| Climb to 10,000 ft. | 20 mins. | 25 mins. |
| Ceiling | 16,000 ft. | 15,000 ft. |
| Endurance (full speed at 5,000 ft.) | 3.3 hours (413 miles) | 3.3 hours (400 miles) |

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(*Continued from page 178.*)

### Brooklands.

The Napier-engined Vickers "Vimy" had its first flying test on Saturday. Capt. Cockerell and Capt. Broome flew the machine for about ten minutes, and, in spite of the bad weather, expressed great satisfaction with its performance. The machine is to go to Martlesham for test almost immediately.

One understands that "Viking III" will conduct further experiments on the Thames above Westminster Bridge daily from Feb. 28th to March 4th.—G. D.

### Woking.

Practically all the employees of Martinsyde, Ltd., received notice to leave on Feb. 17th, and were informed that their services would not be required again, although Mr. Fripp, the receiver in charge, states that the stoppage is only temporary, and due to over-production of motor-cycles which cannot be delivered.

One understands that all the chief officials are leaving, and also that the petition to wind up the company was presented in the Bankruptcy Court about two days before the discharge of workmen, but the result is not to hand.—J. F. S.

# FOREIGN INTELLIGENCE.

## BELGIUM.

### Belgian Air Traffic.

It has been officially decided that the temporary aerodrome at Antwerp which was closed in the autumn will be replaced by a permanent one. In addition to the Brussels, Paris and London mails which were run in 1920, the Belgian S.N.E.T.A. Co. will maintain services to Rotterdam, Amsterdam, and Copenhagen.—E. V. Q.

## FRANCE.

### The Grand Prix.

MM Fernard d'Or and Jean Bernard, on a Farman "Goliath," left Le Bourget Aerodrome at 22.00 on Feb. 20th in the competition for the Grand Prix. At Arras they ran into fog and failed to find the flares round which they had to fly, with the result that they gave up and returned to Le Bourget soon after 02.30 on the 21st with the intention of starting again in the evening.

The prize of 100,000 francs, which has been founded in the memory of M. Henry Deutsch de la Meurthe, is intended as an encouragement to commercial aviation and is limited to French pilots and machines.

The circuit is 2,400 km. via Paris-Lille-Paris-Pau-Paris-Metz-Paris and must be covered within three days. The machines must carry six charges of ballast, each weighing 80 kg., representing six passengers, and 200 kg. of merchandise. Descents at Paris and Pau are compulsory, but pilots may descend elsewhere if they desire.

### A Machine Found in the Mediterranean.

An aeroplane and the dead body of the pilot have been picked up in the sea off the coast of Morocco. Mail matter from Rabat was found which leads to the assumption that the machine belonged to the Rabat-Toulouse air service.

### A Brequet Accident.

On Feb. 12th M. Martel, on Breguet F-CMAD, crashed at Le Bourget when starting on a flight to London. He was taking off with a climbing turn and sideslipped. The machine was "written off," and M. Martel was more or less seriously hurt.—G. D.

## GERMANY.

A correspondent of The Aeroplane in Berlin writes :—

### Temporary Suspension of Frankfurt-Lorrach Services.

Owing to unexpected difficulties, a nice euphonious term that covers a multitude of occurrences, the Frankfort-on-Main-Lorrach aerial post service has been closed. The weather has forced the flights from Nurnberg to Munich to cease for the present, but they will re-open as soon as climatic conditions permit.

### No New Zeppelin Airship.

The report recently circulating as to a huge new airship to be built by the Friedrichshafen Zeppelin Wharves for a foreign Power—whether American or Scandinavian was not stated—is wholly untrue, and is denied by the Fredrichshafen firm, which is still doing nothing.

### The Possibilities of Nuremburg.

The Burgomaster of Nuremburg has notified the Press that four of the proposed international air-routes will pass through this city as well as *via* Furth, namely, the English line plying between Prague and London, the Belgian from Prague to Brussels, both of these with auxiliary services to Vienna, the French Paris-Strassburg-Vienna route and the Italian Trieste-Venice-Hamburg line.

Hainberg landing ground, three kilometres outside Furth, which belongs to the nation, is to be used as an intermediate station, and large repairing works will be erected there, whilst the buildings already standing are to be turned into an hotel.

### Aerial Route Extensions.

The mail transport plying since December 15th between the Rhinelands and Berlin is to be extended from February 1st to Dresden, thus knitting up Dresden and Dortmund in a daily aerial service. Another innovation is the Berlin-Dresden line about to be opened by the Deutsche Luftreederei, with good connections to be made in Berlin for the Brunswick-Dortmund service.

### A New Aeronautical Chief.

The Federal Department for Aeronautics and Automobilism, which for some time past was without a chief owing to differences of an internal nature, has now been entrusted to Privy Government Councillor Herr Bredow of the Prussian Ministry of Public Works, who enters on his new post on March 1st.

### A German View of the New Allied Terms.

Major G. P. Neumann, whose book on German War Aviation will shortly appear in England, publishes the following interesting comment on the Paris Notes and their effect on German aviation in a Berlin daily paper. The article is written whilst under the fresh consternation of the formulated claims :—

"The decisions regarding aeronautics, dated Jan. 29th and handed the German Government by the Supreme Council, treat in two groups of five numbered paragraphs, each on all the questions that have of late been the subjects of demands, threats, and German protests The first group of figures determines the status quo as visualised by the Entente experts. The second section contains the final decisions on the different points, final because there is no court of appeal against them. Like all the decisions of the disarmament note, they are also covered by the threat of a serious condition of affairs that would arise if 'Germany continues further to violate her agreements.' "

The Allied Powers also expressly declare that they confirm their former decisions, that they only "grant new respites," or in other words that they pass by in silence all justified appeals. Nowhere has the slightest attempt been made to enter objectively on these appeals, an attempt that, it is true, would be condemned to non-success from the outset in view of the logical construction of the German appeals, based on the documentary wording of the Versailles Treaty.

We are faced by a new dictature with the mottoes, "Might before right" and "Right or wrong, my country"; the prohibition of all aviation in the police force and the totally unjustified reparation demands for seven naval airships destroyed before the ratification of the Peace Treaty being classed under the first heading, and the embargo on aerial construction coming within the second motto.

It is not surprising that the decision on this point includes the surrender until May 15th of all the remaining war material and, on fulfilment of this condition, promises reopening of construction and imports into Germany for Aug. 15th.

The Supreme Council has, however, created for itself an outlet by means of which to clothe its real intention not to withdraw the construction embargo on Aug. 15th with a vestige of justification. It is set forth that not all the "aeroplanes, hydroplanes, motors, airships, hangars (including those for dispatch), not all parts and accessories of airships, apparatus for wireless telegraphy and photography, hydrogen gas factories and reservoirs, as well as other aeronautic material, have been surrendered."

It is declared that "according to certain estimates" 1,400 aeroplanes and 5,000 motors are still withheld. These figures every connoisseur of the true state of affairs will realise to be erroneous, apparently deduced from an impossible confrontation of the German war production figures with the total of surrendered and destroyed material. The entire fulfilment of delivery is demanded as a basis for withdrawing the ban on construction.

The path the Entente will take is clear. The mass of denunciatory material in its possession, to be used by degrees, even if it refers only to insignificant auxiliary parts or instruments, will enable the prohibition to be prolonged for years if the state of the native market so demands

But even should the Entente be morally forced to permit us to take up construction, it has secured for itself a hold on German aviation by demanding the German Government to recognise its definitions for the differentiation of civilian flying from the barred military flying. This is equivalent to a special permit later for every type of aeroplane or airship.

We have the right to expect from the German Government that it will refuse, as in previous cases, to acknowledge this latest ban on construction, that it will not issue a decree of this nature to the home industry, nor prohibit the export of apparatus built in German yards, but that it will uphold the true facts according to which the construction embargo was ended on July 10th, 1920.—S. B.

# CIVIL AVIATION—SEASON 1921.

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# AIRCRAFT IN PARLIAMENT

## HOUSE OF COMMONS.

In the debate on the Address, Feb. 15th, 1921, Major-General Sir J. DAVIDSON moved an amendment recommending the formation of a Ministry of Defence. He proposed that "A Defence Ministry should be formed composed of representatives of the War Office, the Admiralty and the Air Ministry, to sit for the purpose of solving problems in a logical way. . . ."

Lieut.-General Sir A. HUNTER-WESTON, who seconded the amendment, made the following specific references to aircraft in warfare:—

"If, however, some means of co-ordinating our forces was necessary when our fighting was only on land and sea, how much more necessary is it now, when movement is in three dimensions—not only in a horizontal, but also in a vertical plane—and when we fight, not only on sea and land, but below the surface of the sea and above both sea and land in the air. Between the sea and the land it is possible to make some division, but between sea and air, or between land and air, it is impossible to make any such division. Aeroplanes and airships are essential to the adequate prosecution of war both on sea and on land. Without them we are blind, and, against certain attacks, defenceless. We require them in order to make a modern reconnaissance of the enemy; without them we cannot adequately direct our artillery fire, and we have only anti-aircraft guns to save us from the disastrous physical and moral effect of hostile air attacks. The air is necessary both to the sea and to the land; but the land also is necessary to the air. Although it is true that the independent action of aircraft will become an ever-increasing factor in war, yet the Air Force cannot exist in the air; it must always be largely dependent on the land, and, for certain operations, on the sea. Owing to the intervention of the air, therefore, the connection of the three services has become inexplicably intermingled, and to allow them to go on without some co-ordinating organisation is to make sure both of inefficiency and extravagance."

He was followed in debate by Major-General SEELY, who said he was not in favour of the formation of a Ministry of Defence. He assumed that the separation of the Air Department from the Army was now a *fait accompli*.

He thought that the three services were now distinct services with proper means of co-ordination. In his view "the objection to having a Minister of Defence is that the three great services must each have a head, and he must be supreme in his office. If you have a Minister of Defence with three under-secretaries under him, I am sure that neither the Navy, nor the Army, nor the Air Force will be well and wisely administered. That particular solution would not help us in one of the most urgent needs, namely, co-operation with the Dominions and in India, for most of them have not a Minister of Defence, and from what I can hear from the Dominions they are not likely to adopt that method."

His solution of the difficulty was to have the Committee of Imperial Defence in permanent session with a vice-president responsible to the Prime Minister and himself a member of the Cabinet whose whole duty should be to co-ordinate these three services.

The PRIME MINISTER, who closed the debate, did not seem to be in favour of any change in the present system.

---

Feb. 17th, 1921.—The following oral answer was given:—

Mr. RAPER, Lieut-Col. BURGOYNE and Capt. WEDGWOOD BENN asked the Prime Minister whether it was proposed to appoint a separate Secretary of State for Air, when the appointment would be made, who was at present responsible for the administration of the Air Ministry and whether it was intended that the Secretary of State for the Colonies was to continue to carry out the duties?

The PRIME MINISTER: No decision has yet been reached as to the appointment of a separate Secretary of State for the Air Department. In the meantime my right hon. friend the Secretary of State for the Colonies has agreed to continue to discharge the duty and he will present the Estimates for this year to the House.

Capt. WEDGWOOD BENN: Is the hon. Gentleman aware that the right hon. Gentleman explained to the House that it was necessary that the War Ministry and the Air Ministry should go hand in hand, and what is the reason for the Colonial Minister exercising the duties?

The PRIME MINISTER: I certainly never said that. [HON. MEMBERS: "Yes."] I say no.

# THE ROYAL AERONAUTICAL SOCIETY.

## WEEKLY NOTICES.

### LECTURES.

Air Commodore E. M. Maitland, C.M.G., D.S.O., A.F.C., will preside at the next meeting, which will commence at 5 p.m. on Thursday, March 3rd, in the theatre of the Royal Society of Arts, John Street, Adelphi, W.C. Two papers will be read, on "Parachutes," by Major Orde-Lees, O.B.E., A.F.C., and on "Airship Fabrics," by Mr J. W. W. Dyer.

The last meeting of the present Session will take place on Thursday, March 17th, when Captain D. Nicolson, M.I.N.A., Associate Fellow, will read a paper on "Flying Boat Construction."

### COUNCIL.

At their last meeting the Council completed their consideration of the Secretary's draft amendments to the Rules, which will now, together with the new regulations for the admission of Fellows and Associate Fellows, be laid before the Annual General Meeting for adoption, at 5 p.m. on Thursday, March 31st.

The statement of accounts for the six months ending December 31st, 1920, was also passed at the same meeting, and these, together with the Council's Annual Report on the state of the Society, will be printed in the March issue of the Journal, preparatory to formal adoption of the Report at the Annual General Meeting.

### EARLY HISTORY.

The Secretary is glad to be able to announce that he has been able lately to obtain two copies of the first paper to be read before the Society on its formation, which he has placed in the Library. This was a paper read by Mr. Fred W. Breary, the original honorary Secretary, at Stafford House, on Feb. 28th, 1866, when the Duke of Sutherland occupied the Chair. The occasion was the second Council Meeting (the first having been held at Argyll Lodge on Jan. 12th of the same year), and the paper contains a suggested programme for the proceedings of the Society. The order for its printing and circulation to members has been found in the original minute book in the Society's possession. It is a paper-bound pamphlet of four octavo pages and is believed to be very rare. The Secretary had already a copy in his own possession, but had not previously been able to trace one among the Society's records. He feels that Members will be glad to have this interesting historical addition to the Library. The first paper read before a meeting of the Members as a whole was, of course, F. H. Wenham's paper on "Aerial Locomotion," read at the Royal Society of Arts, on June 27th, also in 1866, which has been reprinted as the first volume of the "Aeronautical Classics."

### ELECTION OF MEMBERS.

The following Members were elected in the various grades, as shown at a Council Meeting held on February 15th:—

Associate Fellows: Flying Officer G. Mornington Bryer, A.F.C., J. D. Campbell, B.Sc., H. B. Wyn Evans, M.I.N.A., Shou-Heng-Huang, Flt. Lt. A. J. Osborn, Lieut C. St. Clair Penny, Sqdn Leader R. G. Parry, D.S.O., E. T. Robins. Students: A. M. Clifton, C. Daniel, E. M. Farris, W. H. Rossiter, V. S. Thompson, M. W. Wo. Foreign Members: R. A. Hendy, Lieut.-Col. H. St. Clair Smallwood, R.A.F.

### LIBRARY.

The following books have been placed in the Society's Library:—"Applied Aerodynamics," Dr. L. Bairstow; "The Design of Screw Propellers for Aircraft," Dr. H. C. Watts.

Royal Aeronautical Society,
7, Albemarle Street, W.1, Feb. 18th, 1921.

W. LOCKWOOD MARSH,
Secretary.

# THE ROYAL AERO CLUB.

## ANNUAL GENERAL MEETING.

The Annual General Meeting of the Members of the Royal Aer Club of the United Kingdom will be held on Wednesday, March 30th 1921, at 3, Clifford Street, New Bond Street, London, W.1, at 6 p.m.

Notices of Motion for the Annual General Meeting must be receive by the Secretary not less than twenty-one days before the Meeting and must be signed by at least Five Members.

### COMMITTEE:

In accordance with the Rules, the Committee shall consist of Members. Members are elected to serve for two years, half th Committee retiring annually.

Retiring Members are eligible for re-election.

The retiring Members of the Committee are:—Lieut.-Col. John D. Dunville; Lieut.-Col. Spenser D. A. Grey, D.S.O.; Brig.-Gen. Si Capel Holden, K.C.B., F.R.S.; Squadron-Leader T. O'B. Hubbard M.C., R.A.F.; Lieut.-Col. F. K. McClean; Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F.; The Viscount Northcliffe; Lieut.-Col Alec Ogilvie; F. Handley Page.

Any two Members of the Club can nominate a Member to serve o the Committee, provided the consent of the Member has been previously obtained The name of the Member thus nominated, wit the name of his proposer and seconder, must be sent in writing t the Secretary not less than fourteen days before the Annual Genera Meeting.

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## INDEX TO ADVERTISERS

| | |
|---|---|
| Accles & Pollock, Ltd. | *Front Cover*<br>*Back Cover* |
| Armstrong Siddeley Motors, Ltd. | 193 |
| Arrol-Johnston, Ltd. | *Front Cover* |
| Auster, Ltd. | *Front Cover* |
| Beardmore Aero Engines, Ltd., The | *Front Cover* |
| Bowden Brake Co., Ltd., The | 196 |
| Bristol Aeroplane Co., Ltd. | 185 |
| Cellon, Ltd. | 195 |
| Cunard Line | 19 |
| Davis Furnace Co., The | 195 |
| De Havilland Aircraft Co., Ltd., The | 191 |
| Fairey Aviation Co., Ltd., The | 175 |
| Handley Page, Ltd. | 193 |
| Kodak, Ltd. | 185 |
| McGregor, Gow, & Holland, Ltd. | 195 |
| Metal Airscrew Co., Ltd. | *Front Cover* |
| Napier, D., & Son, Ltd. | 179 |
| New Pegamoid, Ltd. | 196 |
| Nieuport and General Aircraft Co., Ltd. | 191 |
| Palmer Tyre, Ltd. | 183 |
| Roe, A. V., & Co., Ltd. | *Inside Front Cover* |
| Short Bros., Ltd. | *Back Cover* |
| S. Smith & Sons (M.A.), Ltd. | 177 & 180 |
| Titanine, Ltd. | *Front Cover & Inside Back Cover* |
| Vickers, Ltd. | 187 |
| Westland Aircraft Works | 189 |

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# ON JAPAN'S AERONAUTICAL ACTIVITIES AND THE PROSPECTS OF THE UNITED STATES.

Just as it is possible to respect a person's abilities without having any personal liking for him or her, so one may admire a nation's enterprise and self-reliance without liking the people of that nation. Such is one's personal feeling towards the Japanese nation, which one regards as the great menace to the peace of the Pacific. We may expect that before many years are past the alleged humorists of the Press will be making much sarcastic play with the meaning of the word "Pacific."

It is commonly known that Japan has for many years been building up a Navy and an Army which have already placed her among the foremost of the World's fighting Powers. Japan is not troubled by any nonsense about making the World safe for democracy. Still less has the Japanese Government engaged itself, as ours has done, in making the World safe for hypocrisy. In the most open and above-board fashion Japan has adopted the doctrine of Armed Force as the nation's best safeguard. For this one has the greatest admiration and respect.

### A Little History.

After the Russo-Japanese War Japan was supposed to be bankrupt. Nevertheless by that war Japan acquired a few warships which materially increased the strength of her Navy, and she acquired territory in Asia which has been a valuable source of revenue. Moreover, Japan, by removing Russia from Manchuria and breaking Russia's influence in the Far East, acquired a free hand to trade and make profits in a large area of China without hindrance or competition from Russia.

The result has been that in the ten years between the Russo-Japanese War and the recent European tribe-fight Japan became richer than ever before, and consequently more ambitious. Her factories and her armaments alike increased enormously.

### The Results of OUR War.

During the recent war Japan profited still more. In proportion to her size she made even more profit than did the United States. She supplied her erstwhile enemy, Russia, with shells, small-arm ammunition, guns, and various other war equipment. For every shell which went to Russia, Japan made a couple more, which were stored in her own arsenals. And Russia paid for all three. Moreover, if one's information is correct, the acute Japanese secured payment on delivery in cash or kind by way of the trans-Siberian Railway, while France and England were paid in Russian bonds, which are about as useful as a cheque on Farrow's Bank.

Thus Japan has to-day in her possession enough ammunition and general equipment for her Navy and Army to enable her to fight a first-class war for a year or two, without pressing her munition factories for any extraordinary output.

### Military Guile.

So far as actual fighting in this war was concerned Japan took little part, at any rate not enough to cost her anything worth considering in men or money. For Japan the European tribe-fight was merely an elaborate and extended field of manœuvres and a very interesting study in modern warfare by land and sea.

The siege of Tsing-Tao, the German outpost in China, was undertaken by Japan and prolonged month after month as a convenient method of training her Army. No attempt was made to rush the fortress as the Japanese rushed Port Arthur in the Russo-Japanese War, without regard for loss of life. At Tsing-Tao a line of trenches was captured and fterwards the troops which attacked, having received their aptism of fire and having learnt how to dig trenches and ake cover, were pulled out of the line and sent home. Fresh troops were then put in and the process was repeated.

Thus quite a little corner of the war was used to "blood" n enormous number of troops. In fact it is probable that, thanks to this clever method of conducting the siege, the apanese put more troops under fire than did the United States Army in France, despite the splendid fighting of the Americans at Chateau Thierry, in the Argonne, and at St. Mihiel. And Japan's losses were practically negligible.

### The Education of the Fleet.

In a very similar way a small portion of the Japanese Fleet "assisted" in the Mediterranean, where a multitude of flotilla officers learned all that there was to learn about anti-submarine war, with depth-charges, kite-balloons, seaplanes, and so forth. But Japan never risked any ships of any value in the danger area, though the Japanese dockyards were building warships, large and small, as fast as they could out of the profits made by supplying munitions of war and ordinary merchandise to the European Allies.

It may be recalled that the Japanese Navy was so busy learning all about submarine warfare that it had not even time to make very strenuous efforts to catch the German commerce-raiders in the Indian Ocean, such as the gallant little *Wolff* and the *Möwe*.

In fact, to sum up the situation, the Japanese Army and Navy learned as much from the fracas in Europe as have the various European fighting Services. Perhaps they have learned even more, seeing that onlookers see most of the game. And Japan has made a profit out of learning.

### The Aeronautical Lesson.

How well Japan has learned these lessons may be realised when one considers more recent Japanese activities. So far back as March, 1920, it was reported that the Japanese Military Mission in Europe had bought 300 aeroplanes, chiefly Spads and Farmans, in France. Presumably these were bought from the French Disposals Board, as there has been no news of the Spad or Farman factories being active on Japanese orders.

Much about the same time General Nagaoka, the Chief of the Mission, said: "The next war will be an air war and the nation with the best air service will dominate its rivals both on land and sea." And subsequent events show that Japan is acting up to this obvious doctrine, which seems to be so strangely ignored by our politicians and by those of the United States.

### Recent Developments.

It is curious that Japan's first big purchases of aeroplanes should have been made in France, seeing that England is supposed to be Japan's only European ally. This may be explained by the fact that the Japanese Army is in these days largely under French influence, while the Japanese Navy is modelled on English lines.

This view seems to be borne out by the further fact that, so far as one can discover, no aircraft have been bought in England for the Japanese Army, though a large number—as orders go in these days—have been bought here by the Japanese Navy, and it is said that negotiations are afoot for many more. Also it is understood that French pilots and mechanics have been engaged as instructors for the Japanese Army. And it is known that an Official Mission was to have been sent by the Coastal Area R.A.F. to the Japanese Navy but that this Mission was cancelled at the last moment, it is said as the result of representations made by the United States.

Evidently, however, the Japanese believe in our system of Naval aviation for they have engaged privately as instructors, both technical and on the flying side, certain very able officers formerly of the R.N.A.S. and presumably intend to acquire in this way all the knowledge which they would have acquired from an Official Mission. Which they probably will do just as well and possibly at less expense.

### A Technical Advantage.

In this they will have something of an advantage over an Official Mission, for the officers and men of such a Mission would only be permitted to fly machines which had been duly passed by the Technical Department of the Air Ministry as being up to our own particular standard of safety. This standard (or factor, if you prefer it) is regarded by some of our best designers as being calculated by such highly academic methods as to detract seriously from the performance of our machines without in fact adding in the slightest degree to their safety. In fact there are indications that a few new people much learned in books but with little practical experience are already hindering British design as did certain of their predecessors (since removed) in the Technical Department during the war.

That being so, free British pilots engaged by the Japanese Navy will be at liberty to fly the best possible machines built to the designs of our best possible designers free from official hindrances. And so it may come to pass that the Japanese Flying Services may actually be equipped with better aircraft, either for land or sea, than our own. For, be it remembered, in equipping a foreign fighting service there is no need to bother about airworthiness certificates or the International Air Convention, and so each designer is free to do his best.

### Who is the Enemy?

Now, in the light of the very self-evident fact that Japan is undoubtedly equipping her already great Army and Navy with adequate flying Services, it is necessary to consider how and where those Services are likely to be used. Japan is not likely to be attacked by China, nor by Bolshevik Siberia, nor by the Rajah of Sarawak (who seems to be the nearest independent monarch), nor by the Commonwealth of Australia. Who, then, is the enemy against whom these great preparations are being made? There remains only the United States.

For years there has been talk of war between America and Japan. The chief cause of offence seems to be that the United States refuse to allow Japanese to own land in U.S. territory. This cause has been removed during the last few weeks by Japan's acquiescence in America's right to make her own laws. Such a sudden agreement seems suspicious. *Time Danaos et dona ferentes.*

One must seek for a new cause. Can it be found in America's interference in Siberia, where Japan may covet control of mines and trade? Or in America's possession of the Philippine Islands, which Japan may covet as an outlet for her surplus population?

However it may be, there is never any difficulty in finding a cause for war if two nations are fated to fight. A row between American and Japanese pearl poachers in the Dutch East Indies, or between American and Japanese seal poachers in the Behring Sea, would suffice, even though both parties in either case were criminals in law and pirates by profession.

### When and How?

The more interesting question is when the fight will come? If it comes at all it must come soon. The great new U.S. Navy is not meant to fight us. And if Japan is to fight America, Japan must strike before that American Navy is ready.

The best-informed opinion in this country places the date of the American-Japanese War as beginning in 1924. Japan can hardly have her Air Force ready before then. And if the war is delayed any longer the U.S. Navy will be too strong for Japan to attack it with any hope of success.

If Japan openly takes command of the Pacific, which the Japanese Navy holds in fact to-day, she can then land troops in America at her leisure. And, be it remembered, Japan's Mercantile Marine, which is almost the biggest in the World, can handle her Army as easily as ours handled our own and America's Armies. On the other hand, America's Mercantile Marine, which is large but astonishingly badly organised, can be of very little use except for the transport of munitions from Europe.

Japan would never be so foolish as to land troops on the Pacific Slope of the United States with the Rockies in front of them. She would undoubtedly land them in Mexico, which is already fuller of Japanese than England was full of Germans before the war, and would attack across the plains of Texas where her Armies would have room to manœuvre. Which is one reason why the active service squadrons of the U.S. Air Service are stationed on the Mexican Frontier.

Meantime the Japanese Fleet, with long-range guns and bomb-dropping aeroplanes flying from aircraft-carriers, would make life very unpleasant in Seattle, San Francisco, San Diego, Los Angeles, and other cities more famous for film favourites than for flying forces. And before the attack the Japanese of the Pacific Coast would do quite considerable damage before legging-it (or "beating it," in the still more picturesque American phrase) for Mexican territory.

### The Limited Objective.

Japan could never hope to conquer the United States, but a people so self-confident as they are might well hope to do so much damage to the Pacific coast-towns and in Texas as to compel the States to deliver the Philippines and Hawaii and all mining and commercial rights in Siberia to Japan as the price of peace. And if the United States does not prepare in time Japan might easily obtain her object.

Japan must have an outlet for her surplus population. With the command of the Pacific as the price of peace with the United States, Japan can unload her population all over the Malay Archipelago and the South Sea Islands, ultimately extending her settlements to Australia, unless Australian Labour is wise enough to organise a big Air Force in self defence.

But if the command of the Pacific be the Main Objective, Japan—whose War Staff has studied Clausewitz until it knows him backwards—may well be content with a Limited Objective consisting of the territories in the Pacific now held by the United States only, leaving British, Dutch, and French territory for another war of conquest at a later date. Therefore we may for the present confine our discussion to the U.S.-Japanese War of 1924.

### The British Position.

The position of Great Britain in such a case would be delicate. As the official Ally of Japan it might be thought that we should be compelled to fight against the States. Such is not in the least likely. Apart from the fact that history—from the Treaty of Limerick upwards and downwards, and in view of all our cant about the self-determiantion of small nations (as witness the Irish nation)—shows how little respect we have for a scrap of paper, blood is thicker than water, and family ties are stronger than treaties.

Also we owe much money to the United States, and we do not owe any to Japan, and so it might pay the United States very well to offer to cancel our debt of a thousand million pounds, or whatever it is, as the price of our neutrality. Which would thus leave us free of debt, while ourselves remaining the creditor of all the rest of Europe. No possible Government of English shopkeepers could resist an offer of such a kind, honour or no honour, treaty or no treaty.

Incidentally nobody knows what are the terms of our treaty with Japan, but one believes that when it comes up for renewal, as it does this year or next, we shall "contract out" of any participation with Japan in any war against the United States. And probably the U.S. Government knows it. Despite Mr. Lloyd George's protestations, Secret Diplomacy is to-day a greater power than ever it was.

### What Great Britain Would Do.

We may pull the legs of our young cousins across the Atlantic, chiefly because they are so very young and do respond so easily to the pulling, and so we may in our stupid Teutonic fun make them very angry with us at times. But we have had our wars with the States, and like all fights between brothers and cousins we respect one another the more in consequence, just as at the bottom of our hearts we respect our cousins the Germans more than we have ever done, though we are too hypocritical to admit it yet. So we shall never join in any fight against the States.

We might conceivably, being a nation of shopkeepers, sell munitions (especially aircraft, as we know so much more about such things than do either of the others) to both sides for the first three years of the war, and then "fly to the succour of the vanquisher"—as a French cynic said about Italy. But in the end the British fighting men, if not the British Government, would be fighting on the side of the States.

Long before our commercially-minded politicians had made up their minds to declare openly on the side of the States, our most experienced war-pilots would be in America training and leading the aeroplane formations of the U.S. Army and Navy. Just as that gallant little band of Americans came over at the outbreak of the recent war and formed the famous *Escadrille Lafayette* in the French *Service d'Aviation,* so a crowd of our best would start for the States as soon as Japan declared war, or sooner. And one would like to make a small bet that if he did not happen to be Premier or War Minister at the time, the organiser and leader of that British volunteer force would be Mr. Winston Churchill, who apart from his American parentage has never missed a war in which he could possibly participate during the past twenty-five years.

Probably the Canadians would get there first, but the British contingent would not be far behind. So many citizens of the United States fought and died in the R.N.A.S. and the R.F.C. either on the pretence of being Canadians, or passing as British on the strength of having been to an English public school, like the old Etonian Deighton-Simpson, or, later, as U.S. officers attached R.A.F., that nothing on earth, from the Foreign Enlistment Act downwards, would stop a rush of British pilots, technical officers, and all other classes, to help the Americans against the natural enemy of the White Race in the Pacific.

### The Matter of Mesopotamia.

Incidentally it seems well to point out that the practical certainty of this war in the Pacific is full justification of the Government's policy in Mesopotamia. When America goes to war we shall get no more American oil from the States or from Mexico for our Navy or our automobiles. The Dutch East Indies will be in the war area. The Galician and Roumanian and Caucasian oil fields will be in the hands of the Russians, who will certainly be on the move westward as

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Here the old familiar Fairey "N.10" Seaplane is seen at Bournemouth, arranged with a Napier "Lion" Engine of 450 h.p. and "Single-bay" wings as a racing machine in the Schneider Cup Race. This was the only occasion in an active career of nearly four years when she was flown with any but the original planes fitted when she was built at the beginning of 1917.

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In all this work no single Component Part, except the Undercarriage, has been replaced. Fuselage, Wings, Tail-Plane, Rudder, Elevators, Fin, Tail-Float, even the Engine-Bearers, are those originally fitted. The Wings have only been re-covered once, the Tail-Unit still has the original fabric. The Cock-Pit has been altered to carry one, two, and three people.

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soon as Japan moves in the East. Therefore the Persian and Mesopotamian oil fields are our only hope for adequate supplies.

The Admiralty would be perfectly mad if it allowed the British Government to abandon Mesopotamia, for doing so would mean immobilising all our oil-fuel ships and all our mechanical transport within a few months of the declaration of war between Japan and the States. Thus it will be seen that those who, like the *Daily Mail*, cry aloud against our holding Mesopotamia are in fact helping the Bolshevik cause in Europe and are helping to hand over our people in the Far East and in Australasia to the Japanese.

### Preparations for Peace.

Meantime it is up to the States to prepare for the attack which may come at any time after the next two years

The American line of defence is perfectly simple. The worst attack must come from the sea. Therefore the defence must be against the enemy's ships and bombing aeroplanes.

Against the former the only weapon is the torpedo-dropping aeroplane. Half a dozen torpedo machines, costing in all perhaps £18,000, will account for any £5,000,000 warship a hundred miles from the coast. Therefore a fleet of about a thousand torpedo machines stationed along the Pacific Coast will make that coast safe against gunfire at a cost of less than one battleship.

But over and above these it is necessary to provide defence against the enemy's bombing machines which can leave their ships 200 miles or so from the coast. To meet these machines fighting aeroplanes, anti-aircraft guns, and searchlights are needed in large numbers.

It so happens that we in England are the only people who thoroughly understand anti-aircraft defence. A-A. gunnery is a science to itself, developed entirely by the London Air Defence Area. Co-operation between guns, searchlights and aeroplanes is a highly developed branch of general military science in which the L.A.D.A. became very proficient. If the U.S. Army is not too proud to learn from us, it will do well to set about doing so at once.

Furthermore, fighting machines capable of alighting on and getting off the sea will be needed to escort the torpedo machines in the attack on the Japanese Fleet, for it may be assumed that the Fleet will carry short-range high-performance fighters with which to beat off torpedo attacks. These machines are of a species allied to our amphibian fighting-machines, and here again we know rather more than most people. It is to be hoped that in this direction the U.S. Army, or Navy (whichever has the job of defending the Pacific Coast) will not be too proud to learn from us.

One has no particular affection for San Francisco. Judging by photographs it is as ugly as New York, and one believes that it speaks nearly as ugly a language. But it has had one nasty shaking up from a misdirected earthquake and a consequent fire a few years ago, so one would hate to see it burned again by Japanese long-range shells and aeroplane bombs. And a bomb in those Kinema towns further South would just send them up in one puff of smoke. So really the Americans ought to "get wise to what is coming to them if they don't watch out."

Meantime, as has been said, one is filled with admiration for Japan's energy, and enterprise, and self-confidence. It would be all the better for this country if our political people had as much.—C. G. G.

## THE SUSPENSION OF HANDLEY PAGE TRANSPORT.

It is with the greatest regret that one notes the official announcement that Handley Page Transport, Ltd., have suspended their Continental services until further notice. Thus the last all-British air line ceases to be and the field of much profit hereinafter is left open to the foreigner.

H.P.T. came into existence on Aug. 30th, 1919, and during last summer ran—as can be seen from the tables published in this paper—with great regularity and carried a very large load of passengers and goods.

It had been hoped to better these figures during the coming summer, but it has been found quite impossible to compete against the heavily-subsidised French and Dutch lines, the former of which have reduced their passenger fare to £6 6s. They may reduce it even less than this, seeing that it is possible to make a profit out of their subsidy alone, provided they advertise properly and get the traffic.

However, as Mr. Handley Page points out, he cannot, without an adequate subsidy, bring his rates down level with the French, and it is no use expecting that people in these hard times will pay an extra four guineas for flying in a British machine when they can fly in just the same comfort and nearly as much safety in a French machine.

One would like to mention the three pilots who have been with H.P.T. since its inauguration—Major H. G. Brackley, D.S.O., Major E. L. Foot, M.C., and Mr. R. H. MacIntosh. To these three pilots the service owes much of what success it has attained, and it is with great regret that one hears they are going.

Major Brackley and Major Foot, one believes, are both going abroad, the former to Japan. Mr. MacIntosh is staying in this country, and one hopes to see him soon not entirely disconnected from Civil Aviation.

One offers the officials and servants of the suspended service all sympathy, and hopes that it is only a temporary withdrawal and that we shall soon see Handley Page Transport carrying on with the good work of which at one time they looked like making a big success.

## THE FRENCH AIR TRAVEL RATES.

From March 1st the French air rates between Paris and London will be as follows: Passengers, six guineas, with 30 lbs. of luggage free. Other luggage will be carried at a rate of 11od. per lb.

For goods the rates will be 1s. per lb. up to 100 lbs. and 10d. per lb. for over that amount.

## THE PRINCIPAL AIR AIDE-DE-CAMP TO H.M. THE KING.

The Air Ministry announced on Feb. 25th that:—

The King has been graciously pleased to approve of the appointment of Air Marshal Sir Hugh Montague Trenchard, Bart., K.C.B., D.S.O., Chief of the Air Staff, to be Principal Air Aide-de-Camp to His Majesty.

This appointment is not unexpected, and is in accordance with the common practice in the Army and the Navy. It is gratifying that Sir Hugh Trenchard should be the first in history to hold the appointment.

## THE KING OF THE BELGIANS AND THE D.F.C.

His Majesty the King having been pleased to award the Distinguished Flying Cross to H.M. the King of the Belgians for personal gallantry during the war on the many occasions when he flew over the lines in British aircraft, H.R.H. the Duke of York, K.G., went to Brussels on February 24th to invest that monarch with the decoration.

He was attended by the following Royal Air Force officers: Wing Commander L. L. Greig, M.V.O. (Comptroller and Equerry), Air Commodores C. L. Lambe, C.B., C.M.G., D.S.O., and F. C. Halahan, C.M.G., D.S.O., M.V.O., and Group Captain C. L. N. Newall, C.M.G., C.B.E., A.M.

A state banquet was given at the Palace in Brussels on the evening of the 24th. On the following day the King of the Belgians was invested with the D.F.C. and a luncheon was given at the British Embassy.

The Duke of York returned to England on February 26th.

## THE ENGLAND-AUSTRALIA FLIGHT CELEBRATIONS.

Sir Ross and Sir Keith Smith were entertained to lunch at the Hyde Park Hotel by the Overseas Club and Patriotic League on February 23rd. Major-General J. E. B. Seely was in the chair, and a number of distinguished people were present. The Chairman said pleasant things about the world and Sir Ross and Sir Keith Smith each spoke of the value of aviation in binding the Empire together.

On Thursday, February 24th, Sir Ross Smith, K.B.E., and Sir Keith Smith, K.B.E., were entertained to lunch at the Connaught Rooms by the Imperial Air Fleet Committee.

The Lord Desborough, now entirely recovered from his recent severe death, was in the chair. In the course of a very merry speech he recalled the early days of flying and spoke of the work of the Imperial Air Fleet and finally proposed the health of the Smiths.

Sir Ross Smith in replying paid graceful tributes to the Vickers "Vimy" and the Rolls-Royce engines and pointed out the wonderful organisation of the Shell petrol people. Sir Keith described the enthusiasm and excellent work of their two mechanics.

After one or two more speeches Lord Desborough, in conclusion, said that a speech should be like a lady's dress in that it should be just long enough to cover the subject and just short enough to be interesting.

## THE THAMES ALIGHTING EXPERIMENTS.

According to information received from the Air Ministry that Department has arranged to carry out with the Vickers "Viking" (450-h.p. Napier "Lion") Amphibian G-EAUK further alighting tests on the Thames on five consecutive days beginning some day after March 3rd. The object of the additional tests is to determine any unforeseen difficulties which may arise through changing conditions of tide and weather. The section of the river to be used is that between Westminster and Albert bridges.

"After alighting the machine will, according to the state of the tide, either pick up temporary moorings, or go ashore on the hard adjacent to the Doulton Pottery Works, afterwards taking off and returning to its aerodrome."

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**The key to success in aerial transport**——

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Designers and Manufacturers of Aircraft and Aero Engines,
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# THE AIR ESTIMATES 1921-1922.

The Air Estimates have, with singular disregard for the staff of this news-sheet, been issued during the past week end as a White Paper (30). It is not possible therefore to give an adequate analysis of the various Votes in this issue of the paper. An explanatory statement by the Secretary of State for Air is issued with the Estimates and is printed here as a useful summary of the general principle on which the various allocations are made :—

"The gross total of the Air Estimates as now presented to the House of Commons is £19,033,400; the estimated appropriations-in-aid are £622,400, leaving a net total of £18,411,000. The latter sum is less by £4,581,230 than the corresponding total for 1920-1921 of £22,992,230, voted in the Supplementary Estimate taken in December, 1920.

"The totals for 1921-22 include a gross war liability of £1,585,000 and war credits amounting to £114,000, making a net war charge of £1,471,000. Excluding war liabilities, the net total of the Estimates is £16,940,000, as compared with £14,998,230 in 1920-21. This latter sum was, however, a revision of one of £15,173,430 originally sanctioned but not fully spent, the Supplementary Estimate of December, 1920, being wholly due to an unexpected increase of war liabilities. The under-spendings embodied in the revised Estimate for 1920-21 were actually more considerable than would appear from these figures, since they were partially offset by expenditure on new services which had become necessary. The effect of these under-spendings has been in part to defer expenditure to 1921-22; and even where that has not been the case the causes of under-spending are not expected to operate equally in the coming year.

"The Estimates for 1921-22 include provision on the whole of the financial year in respect of the five additional squadrons, initial expenditure on which was included in the recent Supplementary Estimate. The increase of "normal" expenditure is more than accounted for by this cause, taken in conjunction with the increased prices of labour, material, and transport over those prevailing when the Estimates for 1920-21 were framed. In order to obtain the figure of £18,411,000, every item of these Estimates has been subjected to the most stringent scrutiny, and all services have been curtailed on which, although in themselves desirable, expenditure cannot be fully justified in view of the present financial stringency. To relieve the Works and Buildings Vote, temporary accommodation is wherever possible being improved in preference to the more expensive alternative of capital expenditure on new buildings. It has been decided, after consultation with the Admiralty, to suspend the Royal Air Force Airship service. The maintenance of such a service for fighting purposes at considerable expense would have involved a diminution of effort on services of which the fighting value has been more fully demonstrated. This step will result in considerable economies, although provision has to be made during the next few months for the liquidation of various outstanding liabilities.

"With a view to encouraging the development of Civil Aviation in a time of difficulty, it is proposed, with the sanction of Parliament, to devote a sum not exceeding £60,000 to the grant of subsidies to Civil Aerial Transport Companies under the terms of Lord Weir's report. The total sum allocated to Civil Aviation (including Meteorological services and the cost of Headquarters staff) is again £1,000,000.

"Experimental and Research services cannot be unduly stinted, if the science of aviation is to progress; and although the programme of work for the coming year has been kept within modest limits, there is a considerable carry-over, and the total provision for Research is much the same as that originally made in the Estimates for 1920-21."

It is notable that for the first time an allocation for a Territorial Air Force (of £20,000) appears in the Estimates. The sum is small and will do little more than pay the charges incidental on initial organisation. Another new grant is that of £60,000 for subsidies to aerial transport firms. This grant has been promised for some time and now may serve to keep civil aviation in a state of semi-coma for months to come. But semi-coma is after all preferable to death. From the former revival is possible, from the latter nothing save corruption can spring.

There are several increases in the pay of certain officers and officials. Sir Hugh Trenchard now receives £3,375 in place of £2,725, the Director-General of Supply and Research is to have £2,702 instead of £2,302 and the Secretary of the Air Ministry rises from £2,000 to £3,000. The Air Secretary (Group Captain Scott) is to have £1,500, an increase of £550 on his previous salary.

The gassy side of aeronautics has decreased supplies in the coming year. For the purchase of Airships, etc., only £16,800 is set aside as against £37,000 last year, and for balloons and their attendant pieces the grant has decreased from £50,400 to £17,450.

Further attention will be given to the Estimates next week.

W. E. DE B. W.

For information the Abstract of Air Estimates published on page 3 of the White Paper is given below.

ABSTRACT OF AIR ESTIMATES, 1921-22.

| PAGES. | VOTES. | | ESTIMATES, 1921-22. | | | ESTIMATES, 1920-21. (Including Supplementary Estimate). | | | DIFFERENCES ON NET ESTIMATES. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | GROSS ESTIMATE. | APPROPRIATIONS IN AID | NET ESTIMATE | GROSS ESTIMATE. | APPROPRIATIONS IN AID | NET ESTIMATE. | INCREASE. | DECREASE |
| | | I.—NUMBERS: | | | *Total Numbers.* | | | *Total Numbers.* | *Numbers* | *Numbers.* |
| 4 | A | Total Number of Officers, Warrant Officers, Non-Commissioned Officers, Airmen and Boys on the Establishment of the Royal Air Force, exclusive of those serving in India ... ... ... ... .. | — | — | 30,880 | — | — | 29,730 | 1,150 | — |
| | | II.—EFFECTIVE SERVICES. | £ | £ | £ | £ | £ | £ | £ | £ |
| 5 | 1 | Pay, &c, of the Air Force ... ... ... | 4,899,000 | 105,000 | 4,794,000 | 5,637,850 | 70,000 | 4,967,850 | — | 173,850 |
| 11 | 2 | Quartering, Stores (except Technical) Supplies, and Transport ... ... ... ... | 3,143,009 | 38,000 | 3,105,000 | 2,624,000 | 382,000 | 2,242,000 | 863,000 | — |
| 14 | 3 | Technical and Warlike Stores .. ... | 4,058,000 | 300,000 | 3,758,000 | 9,921,550 | 1,000,000 | 8,921,550 | — | 5,163,550 |
| 17 | 4 | Works, Buildings and Lands ... ... | 3,048,000 | 30,000 | 3,018,000 | 3,685,650 | 209,500 | 3,476,150 | — | 458,150 |
| 24 | 5 | Air Ministry... ... ... ... ... .. | 916,000 | 1,000 | 915,000 | 948,000 | 1,000 | 947,000 | — | 32,000 |
| 38 | 6 | Miscellaneous Effective Services ... ... | 129,500 | 500 | 129,000 | 93,000 | 1,000 | 92,000 | 37,000 | — |
| 43 | 8 | Civil Aviation ... ... ... ... ... | (*a*) 898,000 | 18,000 | (*a*) 880,000 | 429,729 | 8,489 | 421,240 | 458,760 | — |
| 51 | 9 | Experimental and Research Services ... | (*a*) 1,835,000 | 129,000 | (*a*) 1,706,000 | 2,376,440 | 538,000 | 1,838,440 | — | 132,440 |
| | | Total Effective Services .. | 18,926,500 | 621,500 | 18,305,000 | 25,116,219 | 2,202,989 | 22,906,230 | 1,358,760 | 5,959,990 |
| | | III.—NON-EFFECTIVE SERVICES: | | | | | | | | |
| 40 | 7 | Half Pay, Pensins and other Non-Effective Services ... ... ... ... ... .. | (*b*) 106,900 | 900 | (*b*) 106,000 | 86,100 | 100 | 86,000 | 20,000 | — |
| | | Total Effective and Non-Effective Services ... ... ... ... | 19,033,400 | 622,400 | 18,411,000 | 25,202,319 | 2,210,089 | 22,992,230 | 1,378,760 | 5,959,990 |

NET DECREASE ... ... £4,581,230

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*Aircraft Engineering July, 1920.*

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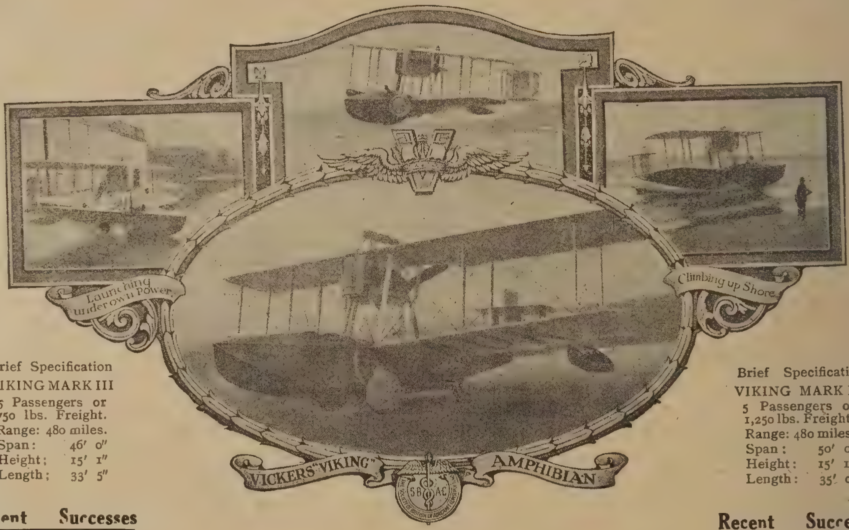

Brief Specification
VIKING MARK III
5 Passengers or
750 lbs. Freight.
Range: 480 miles.
Span: 46′ 0″
Height: 15′ 1″
Length: 33′ 5″

Brief Specification
VIKING MARK IV
5 Passengers or
1,250 lbs. Freight.
Range: 480 miles.
Span: 50′ 0″
Height: 15′ 1″
Length: 35′ 0″

**Recent Successes**

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

1. **Shortest time in "unsticking" from water.**
2. **Fastest time over a given circuit.**
3. **Climb to 1,000 metres.**
4. **Altitude with full load.**

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**GLASGOW—Vickers House, 247, West George Street.**
**BRISTOL—55, Park Street.** **BELFAST—26a, Arthur Street.**
**LEEDS—Greek Street Chambers, Park Row.**
**NORWICH—16, White Lion Street.**

**Recent Successes**

The Vickers Viking was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION September, 1920

Aviation Department,
VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

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## THE WEEKLY COMMENTARY.

The figures relating to the experimental development the Handley Page Wing which were shown by Mr. age at his lecture to the Royal Aeronautical Society, gether with a report of the discussion which then took ace, are reproduced below.

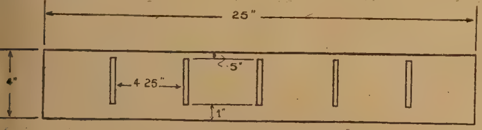
These show that the results possible with the slotted ing are extraordinary, but they also suggest that there are serious mechanical difficulties to the use of the whole range of lift coefficients which are available.

Some new products of the Farman works are illustrated on page 212.

An interesting note on the trend of aircraft design in America will be found on page 214.

## THE HANDLEY PAGE WING—(*Continued*).

The figures which are now reproduced are selected from iong those exhibited by Mr. Handley Page at the lecture ven by him to the Royal Aeronautical Society on Feb. 17th, iich it was impossible to reproduce with the report of the cture itself.



H.P 20. Aerofoil. 5 Slots.

FIG. 1.

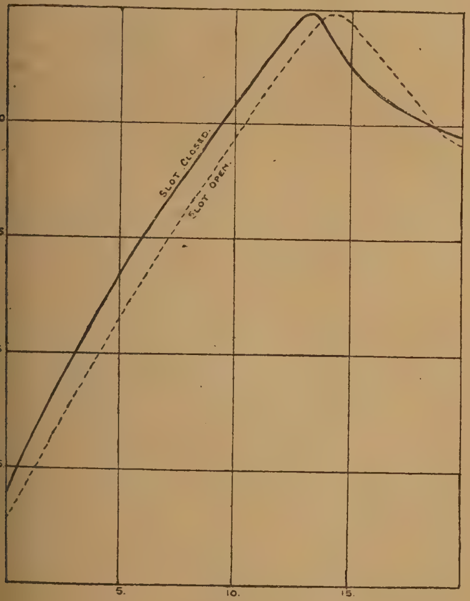
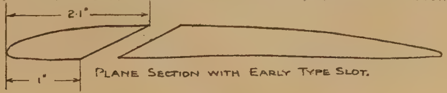


FIG. 2.

n Fig. 1 will be seen the first slotted plane with slots across chord, and in Fig. 2 are shown the results of tests of this ne compared to those with the slots closed. Over the ole range on angles the lift of the slotted plane is lower n that of the unslotted one, but the critical angle is higher and the lift at that angle is very slightly more than that of the unaltered plane.

Fig. 3 shows the first plane with the slot parallel to the leading edge, and Fig. 4 the results of tests on it. It will be seen that there is not a great deal of difference between



Plane Section with Early Type Slot.

FIG. 3.

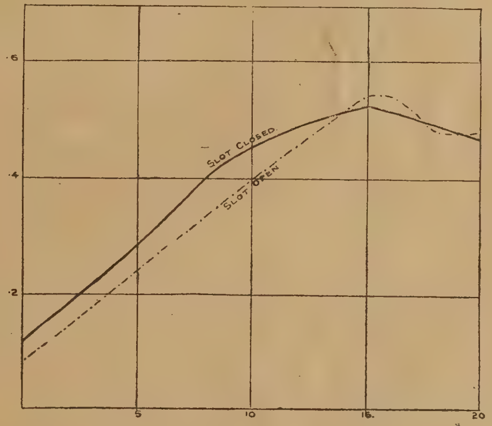
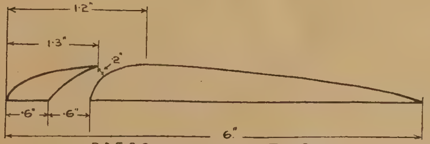
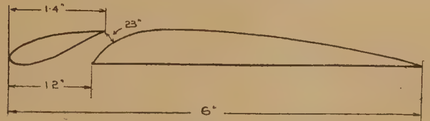


FIG. 4.



R.A.F. 6 Section with Early Type Slot.



R.A.F. 6. Section with Later Type Slot.

FIG. 5.

this and the other type of slot, but that the increase of lift is more perceptible.

Fig. 5 shows two improved types of slots fitted to an aerofoil of the R.A.F.6 type, and Fig. 6 gives the curves of lift for the two slots, and of L/D for the earlier of the types. There is shown, particularly in the case of the later slot, a very marked increase in the maximum lift, and in the stalling angle, when the slot is opened. At the same time the L/D with slot open has fallen very much below that with slot closed till the stalling point of the closed slot is reached. The form of the lift curve for the later type slot indicates that it is probably considerably better than that of the early type, however, in this respect.

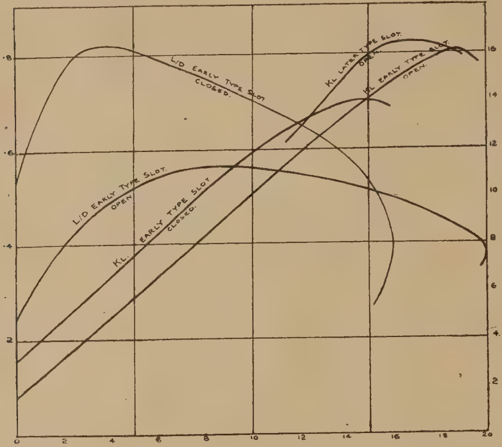
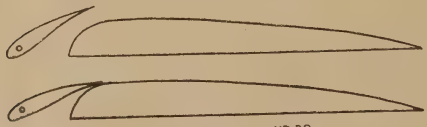


Fig 6.



Slotted Aerofoil No 32.
36"×6"

Fig. 7.

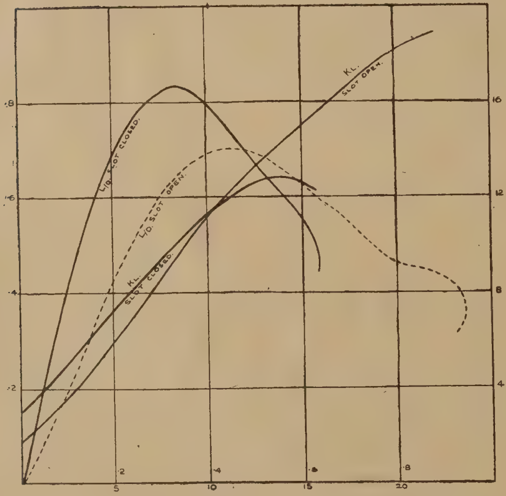


Fig. 8.

Fig. 7 shows a still later type of slot, and Fig. 8 the results of the tests on this wing. Here the increase in maximum lift with the slot open is very great, from about 0.63 to 0.94, and the L/D curve for the open slot much more nearly approaches that with the slot closed, and is better than that of the closed slot wing from a point before the stalling angle. In Fig. 9 the tests of this wing, slot open and slot closed, are plotted on a speed power basis, and show that opening the slot suffices to give a reduction of about 20 per cent. in landing speed.

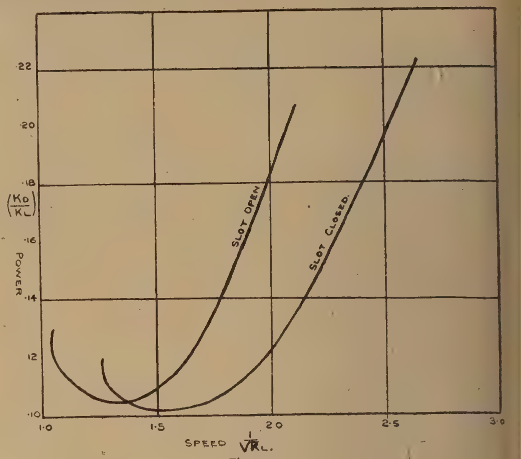
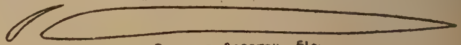
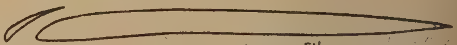


Fig. 9.

Fig. 10 shows two aerofoils of R.A.F.15 type with slightly different slot arrangements, one having a slight "Phillips" entry on the after or main aerofoil, the other having the leading edge on the chord line, and Fig. 11 shows the results of tests on these two compared to those of R.A.F.15.



Slotted Aerofoil. 51a.



Slotted Aerofoil. 51b.

Fig. 10.

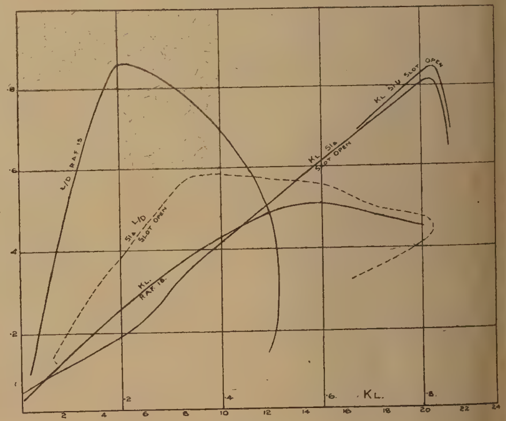
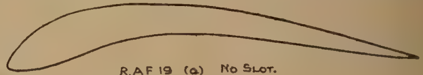


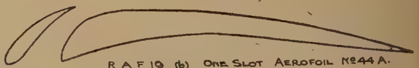
Fig. 11.

Fig. 12 shows the application of slots to aerofoils of the thick high-lift type. R.A.F.19 is the basis of these aerofoils, and a number of variations of the arrangement of slots have been tested, as well as variations in the number of slots from 1 to 7. It will be seen that in the wings with a large number of slots the effective camber of the wing-form has been increased, this having been found necessary to secure the highest possible lift.

In Fig. 13 are shown the results of this development, and it will be seen that the maximum lift obtained with six slots



R.A.F 19 (a) No Slot.



R A F 19 (b) One Slot Aerofoil No 44 A.

Fig. 12.

SPEED

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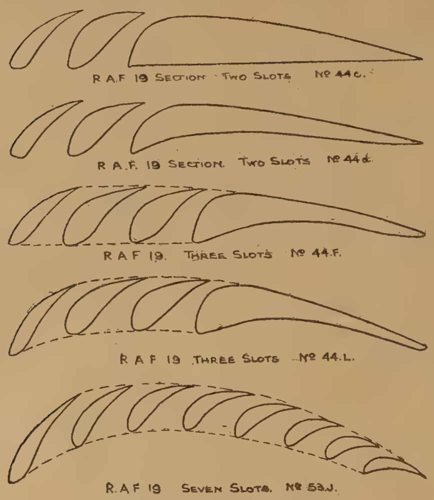
R.A.F 19 Section Two Slots No 44c.
R.A.F. 19 Section. Two Slots No 44d.
R.A.F 19. Three Slots No 44.F.
R.A.F 19 Three Slots No 44.L.
R.A.F 19 Seven Slots. No 53.J.

FIG. 12 (CONTINUED).

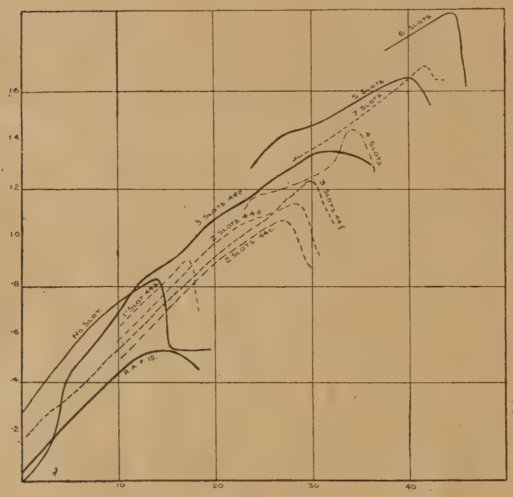

FIG. 13.

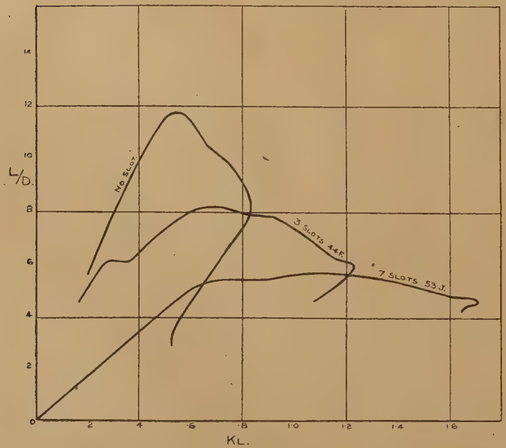

FIG. 14.

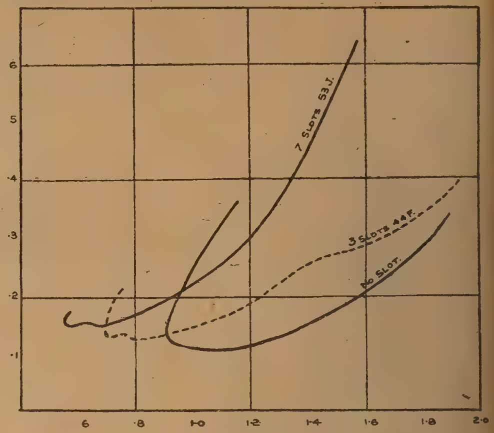

FIG. 15.

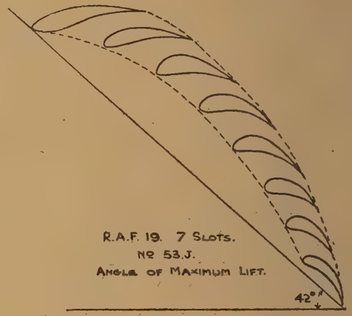

FIG. 16.

reaches the extraordinary figure of 1.96 against a figure of about 0.5 for wings of R.A.F.15 type. The L/D values for R.A.F.19, for a 3-slot and a 7-slot variation thereof are given in Fig. 14. The results on a speed power basis are shown in Fig. 15.

Curiously enough the maximum Lift was obtained with 6 slots, and not with the seven slots. This lift occurred at an incidence of 45 deg., with the trailing edge of the last winglet horizontal. Fig. 16 shows the seven-slot wing at the position of maximum lift.

## The Discussion on the Paper.

**Lt.-Col. Ogilvie** thought Mr. Handley Page must be congratulated both on the manner in which he had presented his results and upon the results themselves. The subject was difficult to discuss at short notice, but it was obvious that the H.P. wing had great possibilities. Comparing Mr. Page's figure of 33 lb. per h.p. with the present machines of equal speed at about 15 lb. per h.p., there need be no great increase in structure weight or in power plant weight, and it was obvious that some 15 lb. of useful load per h.p. could be carried as against the 4 or 5 of to-day. Three times the paying load now possible meant reasonable costs for aerial transport. One very important point was that it was possible to secure such results with landing speeds not higher than the present. Actually landing speeds required to be reduced. The high load per h.p. also permitted of greater engine weight, hence possibilities of greater reliability, also allowed scope for gears and variable-pitch airscrews. His own early machine, evolved from the Wright, weighed 33 lb. per h.p., got off without difficulty at about 38 m.p.h., and climbed 200 ft. per minute with a power plant weighing 11 lb. per h.p. This showed that there was no impossibility about getting off with such loadings and that there was weight to spare for gears or alternative arrangements to give reasonable propulsive efficiency at getting-off speeds and at the much higher speeds needed for cruising. Another point was that the available weight would permit better shock-absorbing gears.

**Mr. L. Bairstowe** said that it was very obvious that between the original inception and the final results Mr. Page had passed through a number of unsuccessful experiments. He was to be congratulated on the results of his pertinacity. He thought Mr. Handley Page's figure of 15 for the L/D of a

The Boulton & Paul P.9.

# BOULTON & PAUL AIRCRAFT for RELIABLE and ECONOMICAL COMMERCIAL AVIATION in 1921.

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**Naturally this meant an accumulation of highly technical experience and the organisation of a staff second to none in the Aircraft Industry.**

**In spite of the "slump" following the cessation of War Orders, Boulton and Paul have kept their Aeronautical Research Department together for the furtherance of experiments and design of Aircraft for Civil Flying, and are thus equipped, owing to their far-seeing policy, to meet all demands for the design and construction of aircraft worthy of their high reputation.**

The P.9. illustrated above is a moderate powered general utility Biplane. It is easy to handle, has a large speed range, and may be used as a two-seater, or, with slight adjustments, as a cargo carrier. The initial cost is low and the cost of running for a machine of this type and performance is reduced to a minimum. Owing to its small size, handling on the ground is easy. Dual controls are fitted, and comfort of pilot and passenger specially considered. The following is a brief specification of the P.9.

*Engine—90 h.p. R.A.F. la type Aircooled.*
*Performance—Speed: Fully loaded, 100 m.h.p. at 1,000 feet.*
*Climb: Fully loaded, 10 minutes to 5,000 feet.*
*Weight—Machine empty, 1,244 lbs.; Useful load (crew, fuel and baggage), 526 lbs.; Total weight fully loaded, 1,770 lbs.; Load per sq. ft., 6.3 lbs.; Weight per b.h.p., 17.7 lbs.*
*Fuel—Tank Capacity with full engine revs. at ground level, 3 hours. Tank capacity, 24 gallons.*
*Principal Dimensions—Span, 27 ft. 6 in.; Length, 25 ft.; Height, 10 ft.; Gap, 5 ft. 6 in.; Chord, 5 ft. 6 in.*

**WRITE TO-DAY FOR FULLEST PARTICULARS.**

## Boulton & Paul Ltd.

TELEGRAMS:
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Chief Office & Works
**NORWICH,** England

LONDON OFFICE:
135-7, QUEEN VICTORIA ST. E.C.4
Telegrams:
BOUTIQUE, CENTRAL LONDON
Telephone: CENTRAL 4642

complete machine was a future figure—it was much better than anything possible to-day. The backward movement of C.P. in the H.P. wing when the slots were opened was accompanied by an increased lift and an increased downwash, and it was fortunate that these two factors tended to compensate each other in their effect on the balance of the machine. He thought there would be difficulties of lateral control with the H.P. wing. Ailerons would work up to the stalling angle of the slotted wing, but when it did stall it would spin much faster than an ordinary wing and the ailerons would be as useless as on the unslotted type. He believed it would eventually be found possible to overcome this trouble.

**Capt. W. H. Sayers** said that he regretted not being fitted with a Handley Page slot this evening. A bad cold had raised his temperature to the critical point and he was afraid burbling might occur. It was curious that many experimenters had attempted to anticipate Mr. Handley Page and failed. He instanced the Hughes-Molesworth triplane of 1910 which had a wing in the form of a heavily staggered triplane, whose leading wing was set at a lower incidence than the two trailing ones, with the intention of deflecting air downwards in easy stages instead of in one jerk. Unfortunately the leading plane was below the trailing ones instead of above it, and as far as discoverable no satisfactory results were obtained.

He (Capt. Sayers) had for long been trying to convince people of the value of high-lift wings. Mr. Page seemed likely to have better luck in this respect. He had the advantage of being able to offer a high-lift wing which could be converted into a high-speed wing. But without this advantage the H.P. wing offered great possibilities. Without calling for an L/D of 15 for the whole machine, valuable results were possible. Assume that Mr. Page's lift coefficient of 2 could be used for landing and that with that wing no better results could be obtained with closed slots than those of R.A.F.19. Twenty lb. per sq. ft. gave a landing speed of 45 m.p.h., and 90 m.p.h. could be reached at about 44 lb. per h.p. At the very least 22 lb. per h.p. of useful load plus four hours' fuel could be carried. This was four times the paying load at three-quarters the speed of present commercial machines, or three times the ton-miles per h.p.-hour. Operating costs per h.p.-hour ought not to increase. It was difficult to persuade people that a 2½ hours' trip to Paris was worth £10 10s., but it might be less difficult to persuade them that a 3½ hours' trip to the same place was worth £3 10s.

**Mr. F. M. Green** inquired as to the seale effects on the H.P. slot. It was well known that it was by no means safe to rely on model results for full-scale purposes, and although it was usually supposed that full-scale results were better than model there was evidence that occasionally the correction might reverse and the full-size machine might give worse results. Like Dr. Bairstowe, he thought a gliding angle of 1 in 15 would be delightful, but did not believe it was possible at present, except with enormous structure weights. The H.P. wing would help matters to a certain extent, but the difficulties of wing manipulation would be serious. Large aeroplanes were not rigid structures and this led to serious difficulties. The case of the war-type aeroplane was often misrepresented; landing speed had not, in practice, entered into the problem, which was solely to obtain quick climb, high ceiling, and high speed at altitudes. The wing with flaps designed to increase lift coefficient and climb had been abandoned because even the extra weight of flaps neutralised the gain in wing properties. [Mr. Green speaks entirely of military craft. For naval purposes low landing speed always had a great importance throughout the war.—Ed.] An aeroplane which could not climb quickly was dangerous, and this was a drawback to the use of such heavy loads as Mr. Page suggested.

**Major O. T. Gnosspelius** said that he had carried out a number of experiments on wings of the type described by Mr. Page. There was doubt of the high lift, but he could not get reasonable L/D values without some form of movable wing. This was a serious disadvantage. But the discovery was of very great importance. A little time back it was believed that there was nothing more to learn about wings. The Handley Page wing had dispelled this idea, which was very far from true.

**Mr. H. Sutton Pippard** said that Mr. Page's results required consideration before they could adequately be discussed. Although the lecture had shown very clearly the stages in the development of the invention, there was a lack of continuity at the point where longitudinal slots were abandoned for transverse ones. This looked like the interposition of a flash of genius. Like other speakers, he thought the difficulties of construction of the H.P. wing were serious. The idea of a flying range of 45 deg. was rather startling; it would mean wings which could be turned about on the body, as one could not land on one's tail. There would be a very great temptation to use such wings merely to increase the useful load, but it was important that the matter of lower landing speed be given due attention.

**Dr. A. P. Thurston** referred to the Hughes-Molesworth triplane and to a series of experiments which he had carried out at the East London College before the war, involving the use of a small rider plane ahead of the main plane, and showing that such a plane could be made to cause the main aerofoil to continue to lift at angles above stalling point. He also showed slides giving lift curves of planes of varying aspect ratios, pointing out that at aspect ratios of 9 and over the stalling point had vanished. Burbling was a matter of end losses, and if end losses were abolished there would be no burbling. [The slides shown indicated that at high aspect ratios there was no sudden fall off in lift at any particular angle. But they serve to indicate that the maximum lift of the high aspect ratio wing was less than that of the square plate.—Ed.]

Although Mr. Page's discoveries seemed to indicate something in the nature of a revolution in methods of aerial support he (Dr. Thurston) thought that he had discovered something even better.

**Col. Bristow** said that he had been seriously perturbed by one casual statement of Mr. Handley Page—to the effect that in their first attempts to test a D.H.9 with the slot, considerations of a few pounds in the cost of alterations had led to trials with a not very satisfactory form of slot. It seemed a very serious matter that investigations of this nature should be hampered by such sordid and paltry considerations, and he thought that the Technical Department of the Air Ministry should have it impressed on them that it was their duty to see that such difficulties did not occur.

Referring to Dr. Thurston's implied claim to have discovered the facts of the H.P. leading edge, he thought it a pity he had not published them earlier. He thought there was no doubt that Mr. Handley Page had established his own priority in the matter.

## The Reply.

**Mr. Handley Page,** in reply, said that he would take the discussion in the reverse order. As to Col. Bristowe's perturbation at such sordid affairs as considerations of cost affecting this work, he was glad to see the Director of Research was present, and hoped that he would profit by the instruction received. As to Dr. Thurston's remarks on the new method of support, he thought such a discovery most opportune in these times of unemployment.

The subject of anticipation had arisen and he had a slide showing a Continental claim to priority. [The Lachmann wing.—Ed.] This wing showed a resemblance to his own, but the shape of the slots and the form of the sectional aerofoils were all wrong. He had made up and tested a model to the diagram published. The general wing form was such as one would expect to give a lift coefficient of about 0.7 without slots. With the slots it actually gave about 0.5. [It is here only fair to Herr Lachmann to state that, firstly, the sketch from which the model was made was a patent specification drawing, and secondly, that Herr Lachmann has publicly lamented the impossibility of having tests made on this wing in Germany. As far as can be discovered Herr Lachmann arrived at the form shown on purely theoretical grounds and has not been able to develop the idea by experimental means.—Ed.]

Dr. Thurston's rider-plane was only a case of a tandem aerofoil. The interference results were known and were not anything like so good as those wherein the planes were combined in the special manner which produced the results he had attained. Burbling might be an end loss effect, but if so it was curious that high aspect ratio planes showed a fall in lift at smaller angles than wings of a lower ratio.

As to the difficulties of construction, these might prove insoluble for the multi-slot type with very great range of incidence. But as the single slot could give increases in lift of over 60 per cent.—or a drop of landing speed of 30 per cent.—for a given loading, he thought the simpler types had an immediate value. Obviously if the multi-slot type were used one could not drop the tail to 45 deg. for landing. It would annoy and alarm passengers. But in this case the heavy loading would allow very robust construction and simplify the difficulties.

As to Major Gnosspelius's remarks, the high L/D could be reached with closed slots. Very great care was necessary to see that with the slot closed the top surface was perfectly smooth and fair.

As to Mr. Green's inquiry as to scale results, the D.H.9 tests were the only available ones and were not very accurate. The model tests indicated for this case an increase of lift coefficient of 40 to 42 per cent. The stalling speed figure indicated an increase of 35 to 36 per cent. High loads meant high speeds at a sacrifice of climb and ceiling, and therefore their value was rather commercial than military. He agreed that, as Capt. Sayers remarked, other people had tried to anticipate his wing and failed. He came across one case—in "The Boys' Book of Science" he thought—where an artist had attached to a gentleman a pair of wings set at a very high angle of incidence, and to prevent stalling had slotted those wings in the right direction to produce the effect.

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. AND THE .

## Aerial Derby Handicap, 1920

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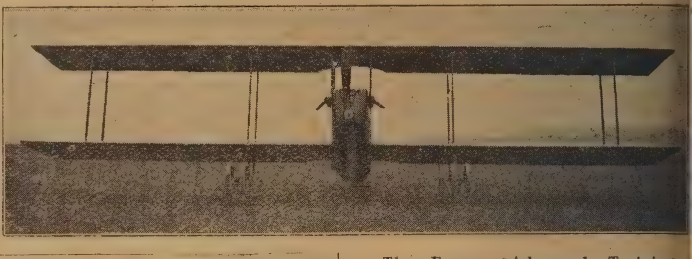
Regarding Mr. Bairstowe's gloomy attitude in regard to spins, they had found with the slotted wing at stalling speed that the machine was very nose-heavy. It would therefore come out of a spin by itself.

As to Col. Ogilvie's machine which flew at 33 lb. per h.p., he thought that this proved that we could do the same and very considerably improve upon the 50 m.p.h. of that performance.

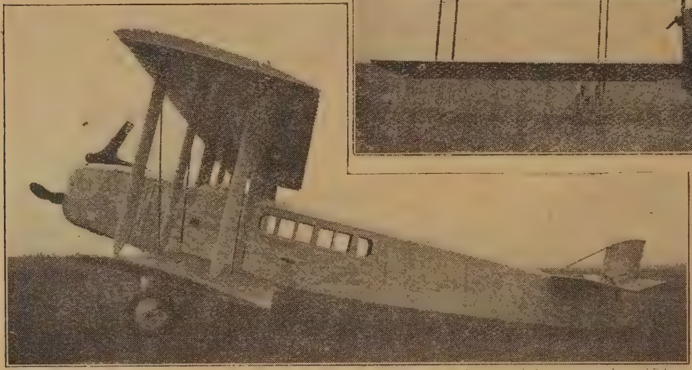
**The Chairman** (Dr. Petaval) then moved a vote of thanks to Mr. Page and the proceedings terminated

## SOME NEW FARMAN AIRCRAFT.

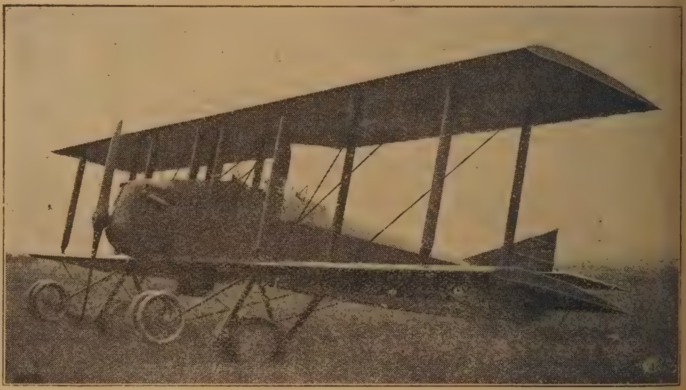
The accompanying photographs illustrate two recent Farman productions. The machine shown by the two pictures on the right-hand side, top and bottom, are those of a new advanced training machine for military pupils. This machine is fitted with an 8-cylinder Renault engine of 190 h.p., and is fitted with complete dual control. The undercarriage has evidently been designed to provide the greatest possible security in landing.



The Farman Advanced Training Machine (190-h.p. Renault Engine).



The Farman F.70 (300-h.p. Renault Engine).



The machine in the central photograph is a passenger-carrier fitted with a 300-h.p. Renault engine, and with an enclosed cabin seating four passengers. It seems fairly obvious that the Farman concern have decided to their own satisfaction that simplicity of design and construction are of more economic value than are aerodynamic refinements.

This is probably entirely a correct view, assuming that for the purposes for which these machines are destined, reasonably low speeds will suffice. In this respect the French promotors of air transport services seem to have adopted a sounder view than have our own, and there seems to be little doubt that as far as cost, both prime and operating, is concerned, French machines are distinctly ahead of our own 125-m.p.h. types.

And the Farman Goliath, despite its slow speed, still seems able to run on the London-Paris service with very fair regularity even in bad weather.

## THE ZAHAROFF SCHOOL OF AERONAUTICS.

The School of Aeronautics established as the result of Sir Basil Zaharoff's generous foundation of the Zaharoff Professorship of Aviation, is situated at 1, Lowther Gardens, Exhibition Road, South Kensington The Zaharoff Professor and Director of the School is Sir Richard Glazebrook, K.C.B., F.R.S., whose staff includes professors of meteorology and aerodynamics, with lecturers on airships, navigation, strength of structures, engine design, and design generally.

The school is administered by an Advisory Committee reporting to the Executive Committee of the College, and consisting of the 12 members, with Sir Arthur Acland as Chairman. The members represent the Imperial College, the Air Ministry, the Aeronautical Research Committee, the University of Cambridge, the Royal Aeronautical Society, and the Society of British Aircraft Constructors. The functions of the staff are classified by the Committee under four heads :—

1) To study, co-ordinate, summarise, apply and extend the experimental work carried out by individual workers at various experimental stations in this country and abroad.

(2) To stimulate research by indicating what information is most urgently required, and what line of attack is likely to prove most profitable.

(3) To guide and encourage research by constructive criticism based on a careful study of past and current work in this country and abroad; and

(4) To impart this knowledge by personal teaching to a limited number of post-graduate students.

One of the duties of the Research Committee is to promote education in aeronautics by co-operating with the Governors of the Imperial College. The school is financed by a grant from the Government of approximately £8,500 a year.

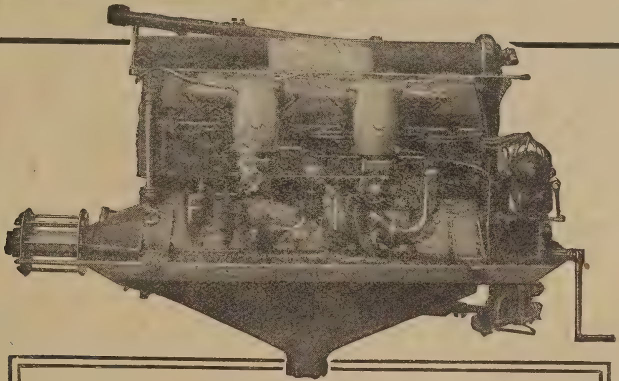
The post-graduate students attend lectures and receive practical instruction in the drawing office at Lowther Gardens, and then pass on to the National Physical Laboratory, the Royal Aircraft Establishment, and other centres of aeronautical investigation.

Arrangements are now being completed for an Easter tour of the south and south-west of England, during which visits will be made to works at Bristol, Yeovil, Southampton, Cowes, Farnborough, etc.

By the kindness of the Air Ministry meteorology is taught at the Meteorological Office at South Kensington under Professor Sir Napier Shaw. The resources of the Air Ministry laboratory are being employed for instruction in navigation and for some practical experience with aero-engines.

These classes are to be continued until the end of the session, but in April students engaged in the study of design and engineering will join the Staff of the R.A.F. as student assistants, and take part in the investigations at Farnborough.

# SUNBEAM-COATALEN
## AIRCRAFT ENGINES



## The
# "Dyak"
### 100 H.P. ENGINE

A long-service engine of the Sunbeam standard of reliability and power, suitable for use under all conditions in small aeroplanes and airships. Experts agree that it attains the highest standard of design and workmanship.

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## FROM AMERICA.

### American Service Airships and Engines.

The Army has bought the T34 (Roma) from the Italians, and the Navy expects the Z.R.2 (ex-R.38) over here in the spring, if they don't break her up beforehand. The Z.R.1 is now being built, contracts for girders, gas-bags, etc., having been let to various firms. The ship will be assembled in the Lakehurst shed in the spring. No accurate data is obtainable as to her size, but it is believed she will be about as large as the R.38, and the power-plant is to consist of five or six Wright (Hispano) 300-h.p. engines. It is possible that the control car will be separate from the forward power car, like on the S.L. ships.

The Army is very satisfied with the Wright 300, and they have refitted a number of D.H.4s. with it, getting a performance comparable to that of the Liberty.

### Air Mail Matters.

In the Air Mail Service the latest ships are Breguet 14C (450 Renault) and the Caproni 600. The latter is to be used for night flying between Chicago and Cheyenne. The pilots are far from enthusiastic about this ship and as to the Junkers they unanimously condemn it. Of the original 8 Junkers the Mail bought, only one remains; several of them crashed in flames, while those which survived until recently had to be scrapped because large cracks began to form in the wing covering. This proves that the duralumin used on these 'buses does crystallise, although the rivets do not shear through, as some have asserted.

At present the rebuilt D.H.4 is the best mail 'bus, but it has the drawback that the mail compartment is not spacious enough. And so it often happens that a machine flies with several mail bags strapped to the wings. (The Vickers people have the right idea with the fat fuselage of their "commercial.")

### The Trend of Aircraft Design in America.

A correspondent who is intimately connected with certain branches of experimental aircraft work in the United States supplies some interesting information as to the general trend of development in that country. Very rightly he imagines that most of the aircraft "publicity" which reaches this country from the States is "bunk," and it seems fairly safe to assume that his own statements are worthy of serious attention.

According to this source of information a good deal of the more important experimental work now in hand is being carried out for the Government, and hence is secret, but that extremely important advances are being made both in details of construction and in the fundamentals of design.

He expects that the States will shortly possess a number of very satisfactory machines embodying variable camber wings giving a surprising speed range. Other lines of development are in process of evolution which promise equally high speed ranges without the mechanical complications of the variable camber devices.

Also he is of the opinion that the biplane is a back number, and that metal monoplanes are coming to the fore. It is said that the only attempt yet made (in America, of course) to build a metal biplane has proved a failure.

There is a tendency toward enclosing pilots as well as passengers, and to the use of single engines rather than multiple engine machines, even in large sizes. Nose radiators are going out of favour.

Engines far in advance of any produced during the war are coming from two separate sources, and are of a type to be produced at motor-car prices when made in quantity. It is admitted, however, that the British development of air-cooled radials is in advance of American engine work, particularly for powers of 200 h.p. and under.

Veneer as a substitute for fabric or wood is going out of favour owing to the extreme climatic range of the States, and all-metal construction seems likely to be standard within a few years. Welded steel tube structures similar to the Fokker fuselage are coming into favour.

The Junkers machine created a great stir, largely as a proof that those who had attempted work on similar lines deserved encouragement. The details of construction, and the controllability of the Junkers are not considered remarkable, but the performance given at the high load per h.p. has given encouragement to the advocates of internal bracing.

Great improvements have been made in fuel systems, radiators have been reduced both in weight and resistance to half the former values, and spinners for airscrews are standard practice.

### Airship Joy-riding.

To start a firm of his own the well-known aeronaut Mr. Ralph Upson has left the Goodyear Co. that are now in process of re-financing and is doing a limited amount of aero business mainly by operating a Pony Blimp (with cabin) at San Diego, Cal.

## THE INSTITUTION OF AERONAUTICAL ENGINEERS.

NOTICES.

*Council Meetings*: The Council met on Feb. 14th and Feb. 21st.

*Elections*: Pilots.—J. Whitworth Jones, F. H. Solomon. Associate.—John Williamson.

*General Meeting*: The General Meeting for the presentation of the Council's Report and Balance Sheet for the year 1920 will take place at 8 p.m., at the Royal Society of Arts, on Tuesday, March 15th.

*Lecture*: The next lecture will take place at 8.30 p.m. at the Royal Society of Arts on Tuesday, March 15th, when Dr. A. P. Thurston, M.I.Ae.E. (Hons.), A.M.I.Mech.E., will read his paper entitled, "Some Points in Aircraft Structural Design." Members who would like to receive an advance copy of the paper, with a view to taking part in the discussion, should notify the Secretary.

*Annual Subscription*: The annual subscription for 1921 became due on January 1st. In the case of all members other than students the annual subscription is two guineas. In the case of students it is half-a-guinea.

*Publications Recently Received*: "Air Sovereignty," by Dr. J. E. Lycklama a Nijeholt; "Uses, Strengths, and Working Stresses of British Columbia Timber," by Hon. T. D. Pattullo, Minister of Lands; "Auto-Propulsao" (Brazil); "Het Vliegveld" (Holland); "How to Use the Air," Messrs. Handley Page, Ltd.

*March Journal*: The March number of the Journal, now being printed, will contain the complete report of Mr. Hector Sleeman's lecture on the possibilities and difficulties of aviation in the Dominions, and the discussion thereon. Other features include a paper on South African aviation, from Major H. R. Coningsby, some suggestions in regard to making known the unique advantages and facilities that aviation affords in the transport of passengers, goods, and mail matter, and various technical and commercial notes. The price to non-members is 3s.

69, Chancery Lane, W.C.2. Douglas Shaw, Secretary.

**Mr. Montague S. Napier, the Chairman of D. Napier and Son, Ltd. Mr. Napier, who lives in the South of France, was responsible for the famous "Lion" and "Cub" engines. He, with the designing staff, laid down the latter engine in France. He is a pioneer of motoring, and was responsible for the first Napier Cars. He foresaw, as far back as 1917, that a big engine of 1,000 h.p. would be needed.**

### A New Aircraft Company.

Sir W. G. Armstrong, Whitworth and Co., Ltd., announce that they have formed a company under the title, Sir W. G. Armstrong, Whitworth Aircraft, Ltd., for the development of their aircraft programme. The company is developing new types of aircraft, and in due course will be in a position to supply types of entirely post-war design suited to meet varying requirements. The formation of this new Company will in no way interfere with the production and design of aircraft engines by Messrs. Armstrong Siddeley Motors Ltd.

This announcement must be regarded as of the first importance. That an engineering firm of the position of Armstrong, Whitworth, who had abandoned the building of aircraft of the war type shortly after the Peace, should now re-enter the Aircraft Industry is a sign that the importance of the recent technical advances in aircraft design, and the commercial and military value of aerial transportation are receiving due recognition in quarters which matter.

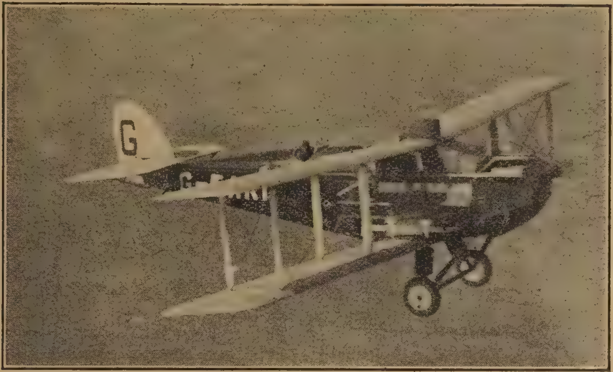
### The Lion.

Owing to the enormous demand for that magnificent engine, the Napier "Lion" which was exhibited at the Imperial War Museum, Crystal Palace has been withdrawn by the Royal Air Force to be put into use. Flying Officer A. J. Insall, who is in charge of the R.A.F. section of the Museum, hopes to get this replaced in the near future.—G. D.

### New Companies.

British Tygard Engines, Ltd.—Private company, registered Feb. 21st. Capital, £15,000 in £1 shares. To adopt an agreement with the Canadian Tygard Engine, Ltd., and to carry on the business of founders, mechanical, electrical, motor and aeronautical engineers, machinery manufacturers, shipbuilders, manufacturers of conveyances for aerial transport, etc. The first directors are J. W. Tygard, Tygard House, 21, Old Gloucester Street, W.C.7, inventor; A. B. Rogers, 15, Walter House, Strand, W.C.; F. S. Gaylor, 4, Old Burlington Street, W.1; S. Stewart, 17, Victoria Street, Westminster, S.W.; R. F. Power, 110, Victoria Street, Westminster, S.W. J. W. Tygard, A. B. Rogers, and S. Stewart are permanent. Remuneration, £150 each per annum (free of income tax) and a percentage of the profits. Registered Office, 17, Victoria Street, Westminster.

# DE HAVILLAND



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**FIRTH'S NICKEL CHROME STEEL.**
Equivalent to Air Ministry Specifications 2S11 and 2S12.

This Steel is recommended for parts which are called upon to resist torsion, shock or bending, such as crankshafts, connecting rods, etc.

It is uniform in quality, and can be relied upon to be free from hard spots and internal and surface defects.

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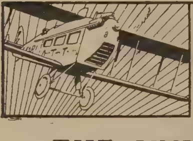
# SHEFFIELD



# COMMERCIAL AERONAUTICS
## AND CIVIL AERIAL TRANSPORT.

## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers: and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G. E. A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

FEBRUARY 21st:

M.A., Breguet, F-CMAC, London-Paris, 12.59-16.25, G.&M., 2, Challoux
S.N.E.T.A., DH4, O-BABI, Brussels-London, 12.37-14.35, G.&M., 1, Briere
G.E.A., "Goliath," F-GEAD, Paris-London, 12.52-14.56, G.&M., 3, Labouchere & 1.

FEBRUARY 22nd:

S.N.E.T.A., DH4, O-BABI, London-Paris, 12.40-15.00, G.&M., 1, Briere.
M.A., Breguet, F-CMAF, Paris-London, 12.45-15.20, G.&M., Nil, Le Men.
S.N.E.T.A., DH9, O-BELG, Brussels-London, 12.40-15.10, G.M., 1, Wouters
M.A., Spad, F-CMAW, Paris-London, 13.50-15.55, G., Nil, Le Sec.

FEBRUARY 23rd:

G.E.A., "Goliath," F-GEAD, London-Paris, 11.56-15.05, G.&M., 2, Labouchere & 1.
M.A., Breguet, F-CMAF, London-Paris, 12.36-15.35, G., 1, Le Men.
M.A., Spad, F-CMAW, London-Paris, 12.44-15.08, G., Nil, Le Sec.
S.N.E.T.A., DH9, O-BEAU, London-Brussels, 13.00-16.05, Nil, Nil, Delzenne.
S.N.E.T.A., DH9, O-BELG, London-Brussels, 13.07-16.00, G.&M., Nil, Wouters.
S.N.E.T.A., DH4, O-BADO, Brussels-London, 12.30-14.45, G.&M., Nil, Van Opstal.

FEBRUARY 24th:

S.N.E.T.A., DH4, O-BADO, London-Brussels, 12.40-15.05, G.&M., Nil, Van Opstal.
S.N.E.T.A., DH9, O-BEAU, Brussels-London, 13.00-15.42, G.&M., Nil, Wouters.
G.E.A., "Goliath," F-GEAC, Paris-London, 13.45-16.05, G., 3, Patin & 1.
M.A., Spad, F-CMAZ, Paris-London, 13.51-16.15, G.&M., 1, Casale.

FEBRUARY 25th:

M.A., Salmson, F-CMAE, Paris-London, 13.28-13.05/26th, G., Nil, Challoux
M.A., Breguet, F-CMAF, Paris-London, 13.29-13.05/26th, G., 2, Charpentier.

FEBRUARY 26th:

G.E.A., "Goliath," F-GEAC, London-Paris, 11.22—, G., 1, Patin & 1.
S.N.E.T.A., DH9, O-BEAU, London-Brussels, 12.20-16.20, G.&M., Nil, Wouters.
M.A., Spad, F-CMAZ, London-Paris, 12.20-14.50, G.&M., Nil, Casale.
M.A., Salmson, F-CMAE, London-St. Inglevert, 15.03-16.30, Nil, Nil, Challoux.

FEBRUARY 27th:

M.A., Breguet, F-CMAG, Paris-London, 10.50-13.40, G., Nil, Le Men.

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FEBRUARY 21st:

H.P.T., O/400, G-EATM, London-Paris, 12.30-16.05, G.&M., 3, ——

FEBRUARY 22nd:

NIL.

FEBRUARY 23rd:

H.P.T., O/400, G-EATM, Paris-London, 12.50-15 30, G.&M., 2, ——

FEBRUARY 24th:

H.P.T., DH9, G-EATA, London-Paris, 12.35-15.27, G.&M., 2, ——

FEBRUARY 25th:

H.P.T., DH9, G-EATA, Paris-London 12.55, landed Lympne 14.35, arr. London 11.07 (26th), G.&M., 2, ——

FEBRUARY 26th:

H.P.T., O/400, G-EATK, London-Paris, 12.00-15.05, G.&M., 3, ——

FEBRUARY 27th:

NIL.

FEBRUARY 28th:

H.P.T., O/400, G-EATK, Paris-London, 12:40—, G &M., 2, ——
Handley Page Transport suspend operations. No more machines will operate from Cricklewood until further notice.

## THE NAPIER TROPHY RACE.

In order that the large crowds who gather on fine days at Croydon might have something other than mere joy-riding to watch, it was decided to organise a short cross handicap race on Sunday. Appropriately enough, in regard to the position they hold in the aeronautical world, D. Napier and Sons, Ltd., were the first to come forward and offer a prize for the event, even though they had no engines in for the race.

It had been hoped to get about half a dozen entries, but unfortunately only two were forthcoming.

One reason for holding the race was in order to attract the public and so bring passengers to help the joy-riding firms who there perform. Therefore one would have expected to have at least one machine each entered by the Leatherhead Aviation Services and the Instone Air Line.

Mr. Chapman very sportingly put both his Avro and his D.H.6 in for the race. For reasons best known to themselves the directors of the Instone Air Line did not see their way to allowing their machines to enter. They had almost a record day for joy-rides, however.

A fine pilot as Mr. Barnard is on the "Vimy" would have materially added to the spectacular value of the race and if as many people as turned up on Sunday—and there must have been at least 5,000—do not appear again because they do not think they had value for their tram fare, and so joy-riding once more declines, the directors of the Instone Air Line will only have themselves to blame.

As it was the race between Mr. Muir on the Avro and Mr. Knowles on the D.H.6 did infinite credit to the sporting owner, Mr. Chapman, who has done as much as anyone and far more than most to help civil flying. The course was ten miles, three times round a 3⅓-mile circuit, the turning points of which were the aerodrome lighthouse, the waterworks and the gasworks, and the finishing line was opposite the control tower. Mr. Knowles on the D.H.6 had two minutes start and Mr. Muir only caught him on the last circuit and won by nine seconds.

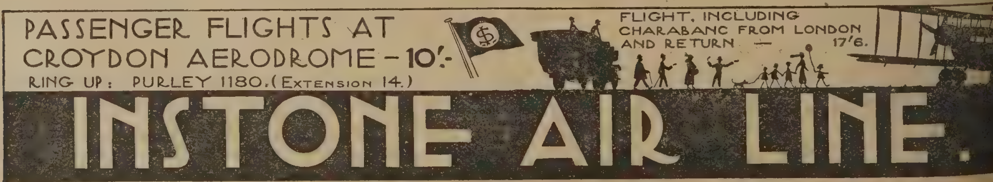
Both he and Mr. Knowles, with whom one had the pleasure of a flight after the race, took all their turning points in great style.

The Department of Civil Aviation readily gave permission to hold the race at the aerodrome and Major Greer and all his staff did their utmost to make it a success.

Mr. Grace acted as a most efficient handicapper and starter, and Mr. Mighell as judge.

Mr. Chapman and his two pilots deserve the very utmost praise and both Capt. Muir and Mr. Knowles put in some very fine flying during the day, as also did Mr. Barnard, who certainly did all in *his* power to help the show from being a "wash out."

The Trust House provided large numbers of teas and luncheons very promptly and excellently served.



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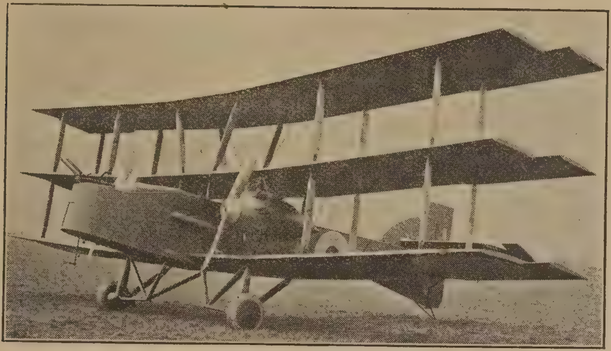

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## INDEX TO ADVERTISERS

oles & Pollock, Ltd. ... ... ...*Front Cover & Inside Back Cover*
rol-Johnstcn, Ltd. ... ... ... *Front Cover*
ster, Ltd. ... ... ... ... ... *Front Cover*
tomatic Telegraph Co,... ... ... ... 219
rdmore Aero Engines, Ltd., The *Front Cover*
ulton & Paul, Ltd, ... ... ... ... 209
wden Brake Co., Ltd., The ... ... ... 220
y, Gibb & Co., Ltd. ... .. ... ... 219
stol Aeroplane Co., Ltd. ... ... ... 201
lington Publishing Co., Ltd., The... ... 218
Cunard Line ... ... ... ... ... ... 220
De Havilland Aircraft Co., Ltd., The... ... 215
Fairey Aviation Co., Ltd., The ... ... ... 199
Firth, Thos., & Sons, Ltd. ... .. ... 215
Hancock, James Lyne, Ltd. .. ... ... 220
Handley Page, Ltd. ... ... ... ... 217
Imray, Laurie, Norie & Wilson, Ltd. ... ... 220
Instone Air Line ... ... ... ... ... 216
Martinsyde, Ltd. ... ... ... ... *Back Cover*
Metal Airscrew Co., Ltd. ... ... .. *Front Cover*
Naylor Brothers, Ltd. ... ... ... ... 218
New Pegamoid, Ltd. ... ... ... ... 220
Nieuport and General Aircraft Co., Ltd. ... 217
Roe, A. V., & Co., Ltd. ... ...*Inside Front Cover*
Rolls-Royce, Ltd. ... ... ... ... ... 203
Rubery, Owen & Co. ... ... ... ... 218
Sankey, J. H., & Son, Ltd. ... ... ... 218
"Shell" Marketing Co. ... ... ... ... 207
Sunbeam Motor Car Co., Ltd. ... ... ... 213
Supermarine Aviation Works, Ltd., The *Back Cover*
Titanine, Ltd. ... ... ...*Front Cover & 211*
Vickers, Ltd.... ... ... ... ... ... 204

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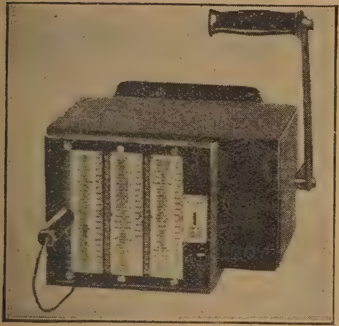

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MARCH 9, 1921.

# THE AEROPLANE

VOL. XX. No. 10.

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## ON LANDINGS, DOCTORS, AND THINGS.

If ever you want to get up a really good argument in any place where aviators are gathered together start a conversation on landing—coupled with the name of the R.A.F. Medical Boards. The latter are bound to come into the affray somehow, whether you start by mentioning them or not, and they will probable be the one subject on which all the company will be unanimous, though opinions in that unanimity may vary all the way between a contemptuous admission that the poor things do their best according to their lights, in their ignorance of flying, and a wholesale damnation of them as the curse of the R.A.F. and of Civil Aviation. No pilot ever yet loved a doctor, except when he was being patched up after a crash.

Even a casual remark about landing will, as the Americans say, "get somebody's goat." For example, here is a letter, certainly of the most polite kind, from quite an experienced pilot, who seems to write more in sorrow than in anger as the result of an unconsidered phrase in this paper a few weeks ago. The letter reads as follows :—

> Dear Sir,—On page 924 of your issue of December 22nd, I notice the following: "No decent pilot looks at the ground when landing."
>
> As an ordinary pilot of over five years' pretty continuous flying, and only one crash during that time, I must confess that I *do* look at the ground when landing. So I stand a self-confessed bad pilot. But my method has proved successful.
>
> I write, not as a critic, but as a seeker after knowledge, realising that one can always learn. Where *should* a pilot look? For information on this subject I should be grateful. (Signed) "LATUS."

### A Question to Pilots.

Now, as a matter of fact, does any pilot ever look at the ground when he is landing? That is to say, does he look at the actual piece of ground on which he intends his machine to touch when it first strikes land? One does not profess to be an aviator, but, from what various experienced pilots have said, one is fairly sure that the man who looks at the ground is almost certain to crash.

Several of the best instructors of one's acquaintance in the old days when people flew open-fronted box-kites used to go to any amount of trouble to train pupils to look anywhere else other than the ground in front when landing. One at least of them ascribed the fondness of pupils for flying straight into the ground, instead of flattening out at the right moment, to the fact that when they stared anxiously at the ground as it raced past under them they became in a manner mesmerised by the stream of green and lost all sense of height.

Another very good pilot said that when he had once got into position for landing and was heading in the right direction, he always looked out along one wing and judged his height by the trees and hedges beyond the wing-tip. He kept his direction by taking an occasional glance to the front without turning his head in that direction.

### Analogous Cases.

To test the theory that looking at the ground entails a crash, try the simple experiment of running down stairs while looking at the steps on which you are putting your feet. The chances are that inside twenty steps you will have become dazzled and will either have crossed your feet and crashed or will have slipped over the edge of a step and have sat down hard, if you have not saved yourself by clinging to the bannisters. One strongly recommends the spiral staircase at a Tube station for this experiment.

As a matter of fact when running down stairs one does not look at the individual steps at all. One take a general view of the walls, bannisters, and stairway some ten or fifteen feet ahead, and adjusts one's stride by feel and not by sight.

Similarly in hunting, if a rider looked at the actual spot on which his horse was going to put his feet after taking a "lep," he would probably fall off, or take a pull at his reins which would baulk the horse in landing and produce the devil of a toss. The rider, in fact, on topping a "lep" takes a rapid glance at everything on the other side, "reconnoithrin' which way he'd fall," as Mr. Slipper in the "Irish R.M." says. And he does the rest by feel, not by sight.

### A Medical Board Story.

One of the best yarns in connection with landing concerns a distinguished Irish officer who did good work on D.H.2s in their days in France. After he had been on a Home Station for some time he went sick, and on recovering presented himself before a Medical Board who pronounced him fit in body and mind (the latter, one imagines, with some doubts), and then passed him on to the oculist of the Board.

This gentleman, after examining his eyes for a long time, advised him to give up flying, for, as he said, "If you go on flying with eyes like that you are certain to have a serious accident."

The Irishman wanted to know why. He was told that he had a concealed squint, or something of that sort, and that consequently his eyes must have always deceived him as to the precise position of the ground, or anything else at which he was looking. Whereupon he asked the doctor how long he might reasonably expect to go on flying before he crashed.

The doctor man told him that he might with luck fly for two or three weeks, but that he could not expect to go on much longer without collecting it.

"But," said the amazed Irishman, "I've done two years instructing, and a year and a half in France flying single-seat fighters, and best part of a year since at a fighting school. And I've never so much as broken a wire. And I can see as well as ever I could in my life."

The doctor was quite seriously annoyed at such a grave offence against medical theories, and said, "But you can't see to land properly!" "And may I ask you," replied the Irishman, "what the devil I would be doing *seeing to land*?" "Well, if you don't see to land, how *do* you land?" asked the doctor. "Why, I *feel* for the ground, to be sure!" said the Irishman.

### One Way of Landing.

After that the doctor was still more annoyed, so the Irishman condescended to explain to him that the surest way of crashing was to look at the ground, and he proceeded to set forth his own method, which is thus.

When he takes a strange machine off the ground he takes it up good and high and then throttles down, or "buttons on and off" with the switch, till he has discovered what precisely is the lowest speed at which the machine will fly without stalling. He never depends on his speed indicator for this, but relies entirely on the "feel" of the controls, experimenting in turn with elevator and ailerons and rudder till he knows just how the machine feels when still under proper control, but on the verge of stalling.

Then, and not till then, he comes into the aerodrome to land. He has a look round, decides where he is going to plant the machine, points her at the desired spot, glides down to it, and when a glance at the surrounding country tells him he is near enough to the ground he pulls the control-stick back to what he has learnt to be the slowest safe speed, and just sits there till the machine lands herself.

There may perhaps be other and better methods of landing. If so it would be interesting to know of them, and doubtless they would be educative and useful to the many thousands of pilots who do one the honour of reading this paper. But certainly as one very satisfactory way of landing that of the cheery Irishman has its merits.

It does at any rate prove that perfect eyesight is not necessary to the safety of an aviator. In fact, one would much rather trust oneself to the care of a brainy pilot who had defective eyes and knew it than to some of the young men who are passed into the R.A.F. by the Medical Boards with 100% eyes and 50% intellects and 25% manners.

### Another Story.

Apropos that same Irish pilot, there is another story which has nothing to do with landing, but deserves to be told as illustrating his comic methods. Rather late in the War he was posted to a fighting school. On arriving he found that the aerodrome consisted mostly of sand, and that the only machine capable of flying was an aged B.E.2c.

When he went to take the old kite out for an airing he found that generations of pilots and pupils, climbing in with wet boots, had filled the bottom of the fuselage with sand, and that the local workshop officer had been too lazy, or too busy, to have the fuselage covering unlaced and the sand extracted, a job which would have been somewhat hindered by the three-ply bottom to the front part of the fuselage. Being Irish, and therefore combative as well as essentially practical, he raised a row about the state of the machine, and when the "properly constituted authority" had promised to have the job done he cut the argument short by saying that he would do it himself while they were thinking about it.

So while the rest were talking he had the engine started, climbed into the machine, took her up to about 2,000 feet, turned her over on her back and then shook her violently from side to side. The sand fell out by the bagfull, like ballast from a balloon, and when it had stopped falling he turned the machine right side up, landed in front of the sheds, and remarked to the astonished staff that that was the quickest way of cleaning the cock-pit of an aeroplane.

But he said in telling the yarn afterwards, "I was nearly choked and blinded with the sand getting up my nose and under my goggles," so one does not recommend this method to young pilots. That is unless they happen to be taking up politicians or such "matter in the wrong place."

### The Triumphant Hun.

There are many good stories of quaint landings in that wonderful book by the late Major Jimmy McCudden, V.C., "Five Years in the R.F.C.," especially that of the balloon-strafer who landed in splinters on the hill beyond Cassel. One recommends them to the younger pilots of the R.F.C.

There is another about the lamented Squadron-Commander Little, R.N.A.S., which deserves to be added to them. Little had been fighting a German two-seater, he himself being on a "Camel," so far as one can remember. He put the German's engine out of action behind our lines, so the pilot glided down and made a perfect landing. In his keenness to be "in at the death" Little came down behind him, landed too fast, hit a bump, turned over and wrote-off his machine completely.

He extricated himself from the wreckage, ran over to the German machine and demanded the surrender of the crew. The German pilot, who had put up a fine fight and was an absolute sportsman, walked to meet him, shook him warmly by the hand, congratulated him on his victory, and added, "But to look at our machines it might be thought that I was the victor."

It is interesting to learn that on his repatriation after the war this German pilot wrote to our Air Ministry asking for Major Little's address, as he wished to meet again his gallant enemy. The Air Ministry informed him that Major Little had been killed nearly at the end of the war, and gave the address of his widow. The German pilot thereupon wrote to Mrs. Little a very charming and chivalrous letter lamenting the death of so brave an officer and regretting that he would not be able to meet him and talk over their battle and Major Little's subsequent kindness to him. It is encouraging to find already such kindly feeling between former enemies and it is a happy augury for the alliance which must come in our future war against the Slav Invaders some fifteen or twenty years hence.

### Useful Studies.

One recommends to all young pilots of the R.A.F. the study of this question of landing There is an old and feeble joke which says, "It is not the fall that hurts, it is the bump at the bottom." Similarly it is not in the air that pilots, experienced or inexperienced, come to sticky ends, it is when they hit the ground.

Any fool can fly when once he is in the air. It is getting off and onto the ground that matters. And that is where brains are wanted.

It is precisely in such matters as this that a doctor of the type of the late lamented Louis Stamm is so much superior to the hide-bound respecter of regulations who insists on a candidate for the R.A.F. having two perfect eyes, regardless of whether he is defective in quickness of perception or orderliness of thought.

The old fallacy, *Mens sana in corpore sano,* still carries too much weight with doctors. A quick brain and a comprehensive intelligence is much more valuable to an aviator, whether Service or civilian, than is perfect eyesight or faultless physique.

Some of the best pilots have, or have had, only one eye. There used to be one such of whom it was said that he flew best when he was drunk. The theory was that alcohol sharpened his perception, and that having only one eye he could not see double and consequently always landed on the place that was there instead of on the place that was not, as he might have done if he had chosen the wrong one of two.

One does not advocate the practice of manning the R.A.F. with one-eyed dipsomaniacs. But one does certainly hold that R.A.F. Medical Boards would do better work for the Personnel of the R.A.F. if they had less science and more sense. Still, one cannot expect perfection all at once, and even doctors learn if one gives them time.

At the time when Mr. "Pussyfoot" Johnson lost an eye in a "rag" run by medical students, and when Mr. Asquith lost his hat in another, a would-be humourous paper asked, "Why is it necessary to be a cad before becoming a doctor?" Without going so far as that one merely suggests that if some R.A.F. doctors knew rather more about the practical side of aviation they would be far more valuable to the R.A.F. and to Civil Aviation also. There are *some* very good doctors in the R.A.F. It is to be hoped that they may in time leaven the lump.—C. G. G.

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## THE AIR ESTIMATES, 1921-22.—II.

As was explained last week the net increase in the Estimates excluding war liabilities is almost exactly £2,000,000. Including war liabilities the net decrease is £4,581,230. So that allowing for natural expansion the Estimates show little external change from those of last year.

### The Pay Vote

Vote I, Pay, etc., of the Royal Air Force, shows a total of £4,794,000 which, after allowing for an Appropriation in Aid of £105,000, shows a net decrease of £173,850, though the estimated strength in personnel has increased from 29,730 to 30,880. This apparent anomaly is largely explained by the enormous reduction in payments under Subhead 9, Service Gratuities to Officers and Men on discharge, etc. The decrease in this case is £150,000. Another considerable decrease is found under Subhead D, Miscellaneous Allowances, in which outfit allowances for officers are £15,000 as against £41,500 last year. A further £17,750 is saved on Recruiting Staff and Expenses.

### Quartering, etc.

This Vote which has now a total of £3,105,000 shows a net increase of £863,000 and has nothing of unusual interest on which to comment. Personnel must be transported and fed and warmed and damaged by doctors in each succeeding year without much variation. Hence there is little scope for imagination and charm is almost entirely lacking.

### Technical and Warlike Stores.

The net decrease on this Vote is £5,163,000 and the total sum to be expended is £3,758,000 A sum of £6,537,000 was expended last year in settlement for Aircraft Supplies delivered under War Contracts. This year no charge appears under this heading. It is extraordinary to think of the amount of money spent during the war and immediately afterwards in the purchase of aircraft, and to consider a little sadly the present state of aviation in England. Who has had the money? Were the greater number of manufacturers of aircraft bad business men or did good business men come into the industry for the profit-making period only and then return happy and wealthy to the ordinary avocations of their daily life? Perhaps indeed the profits have largely been diverted into the industries of wine, women and song.

Savings are effected in regard to airships, balloons and aircraft technical and warlike stores. Rewards to inventors and miscellaneous claims (war liability) have jumped from £450,000 to £700,000. The allocation for the purchase of ammunition is £195,000 as against £75,000 last year. War is not yet an extinct occupation it seems.

### Works, Buildings and Lands.

The allocation of £3,018,000 is made this year under Vote 4 for Works, Buildings and Lands and as against last year there is a net decrease of £458,150.

The biggest allocation is for Halton Park, the boys' training establishment, and which is to cost altogether £1,394,000, of which £470,000 has already been expended, £137,000 more will have been expended by the end of the financial year and £340,000 is to be voted for the coming year. The General Hospital at Halton is to cost £300,000, of which £10,000 is to be spent in the coming year.

Among other new works are five stations in the canal zone in Egypt which in the end will cost altogether £670,000,

# LAUNCHING

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The illustration above shows a machine being launched on the Thames.

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of which £163,250 is to be voted for the coming year. Otherwise there is nothing very startling in the Vote to record.

### AIR MINISTRY.

The sum of £915,000 is allotted under Vote 5 to cover the expense of the Air Ministry. This sum is less by £32,000 than that set down in the past year Various increases in the pay of members of the Council, such as Chief of the Air Staff and the Secretary of the Air Ministry, were recorded in the last issue of this paper. Otherwise there is little change of note.

As is proper in the present state of civil aviation, the Department of the Controller-General has decreased a little in its cost. The reduction is mainly due to the change in the number of temporary employees from 70 in 1920-21 to 17 in 1921-22.

### CIVIL AVIATION.

The next Vote of real interest is No. 8, under which £880,000 is set aside for Civil Aviation. Under this Vote there is a net increase of £458,760 over that of last year. £129,000 of this increase is due to the rise in the charge for salaries and wages from £49,000 to £178,000. As was natural, Works, Buildings and Lands have gone up from £157,000 to £356,000.

Meteorological Services, which are so highly important in aviation generally, now cost (excluding the Headquarters Staff) £102,000 as against £70,629.

### AIRSHIPS IN CIVIL AVIATION.

The Royal Air Force has reduced its expenditure in Airship work. As a kind of balance, a charge of £5,500 appears for the first time in regard to Civilian Flying Officers and Staff for Airship Service, and another of £40,000 for the Maintenance and Repair of Airships.

Prizes and Rewards, for which £44,000 was set aside in the last financial year now disappear altogether.

### SUBSIDIES.

Under Subhead E Miscellaneous appears Subsidies to Civil Aerial Transport Companies £60,000, an entry which will bring joy to the hearts of those who have agitated so long for direct Government assistance in the matter of flying.

An analysis of this Vote is really a waste of time as, according to Mr. Churchill, it is intended to give the greatest freedom to the civil aviation officials to spend the money allotted in the most suitable way and on the most suitable objects provided that the Estimate is in no way exceeded.

### EXPERIMENTAL AND RESEARCH SERVICES.

Though a decrease of £132,440 is shown, the actual amount available for expenditure in these matters is increased by over £900,000, as £61,000 less is being expended on the Royal Airship Works at Cardington, and £843,000 less on the Liquidation of War Liabilities. The main increase in expenditure is on Technical Equipment and Materials, which has increased by £239,610 to a total of £187,000. Of this £445,000 is to be expended on aircraft, £151,500 on engines and only £7,000 on airships. The total Vote for Experimental and Research Services amounts to £1,706,000.

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## The Debate on the Air Estimates.

On March 1st, 1921, the Air Estimates were taken in Committee of Supply and the Secretary of State for Air made his statement after the order for Committee had been read.

He said that it was the third time he had presented the Air Estimates to the House and that the Air Force had substantially been under the same administration for more than two whole years, there had been the same Chief of the Air Staff, the same Controller-General of Civil Aviation, the same Director of Personnel, the same Director of Equipment, and practically the same officers in command of Areas and Schools, and the same Secretary of State, "and undoubtedly we should have had the same Under Secretary of State but for the wayward proclivities of my right honourable and gallant friend." He said that he had thought that it would take five years to make an efficient Air Force. About 18 months of the five years had gone and the progress was much greater than had been hoped for. This had been rendered possible by the continued administration.

### COMPLEXITY

He then discussed the complexity of the organisation of an Air Force, and said that there were 54 trades, of which 30 were highly skilled, involved in the production and the repair of an aeroplane.

### DIVERSE DEMANDS.

The demands of the Navy and Army were diverse. Each specified for a large number of separate and particular functions, each requiring a special type of machine and each a specially trained pilot. For instance, machines were required for the Navy to spot the fall of shot fired at vessels completely concealed below the horizon, amphibious aircraft of a large size were required for reconnaissance in order to save far more expensive cruisers, large bombing and torpedo machines were necessary to attack heavy enemy ships in their own harbours and also at sea in competition with the torpedo-boat destroyer. Small fighting machines to rise from the deck of ships and afterwards to alight on them again were equally necessary.

In the case of the Army spotting aeroplanes were necessary for artillery, reconnaissance machines for infantry, fighting aircraft for infantry, these latter to be heavily armoured, machines to operate with the tanks, short and long distance bombing aircraft and many different types of fighting aircraft.

### TRAINING.

He said that it was necessary not only to make officers of Air Force personnel capable of training and handling men in the proper manner but also to make them into satisfactory pilots. Having done both of these difficult feats it was necessary that each should be capable of fulfilling at least one of the highly specialised functions of aerial war gunnery, bombing, torpedoing, photography, wireless telegraphy, spotting for artillery, observing and other functions of that kind. Consequently a large number of schools and training establishments were necessary. He then proceeded to explain some of these establishments to the House.

### HALTON CAMP.

"At Halton we are going to train 3,000 boys to be skilled mechanics, with an eventual output of 1,000 a year, and here and at Manston adult recruits are now undergoing an intensive course of technical training. At Cranwell we are training cadets to be officers, and simultaneously a large number of the boy mechanics who are eventually to be accommodated at Halton. At Upavon we are teaching men to be instructors in flying, and officers are also given a course of practical engineering. At Netheravon and five other training schools, one of which will be in Egypt, we are training officers to become highly skilled pilots, not instructors, but pilots. At Andover a school will be opened to teach air pilotage and night flying. Eastchurch will be a station where armament, aerial gunnery, and bombing are taught.

"At Gosport they will learn torpedo dropping from aircraft, and experiments are being conducted to improve the methods of observation for naval guns, and the wireless control of surface craft, that is to say, of self-propelled vessels which move without any man on them through the sea and are directed in their movements by an aeroplane in the air with wireless.

"At Flowerdown there is an electrical and wireless school. I need scarcely say that each of the schools which I have mentioned is the head of an extremely elaborate, complicated, and mentally dominating study and art, which has its relation to the general purpose we have in hand. At Larkhill kite-balloon training is undertaken.

"At Farnborough, photography in all its forms, that is to say, the taking of photographs, the reproduction of photographs rapidly, the understanding and reading of photographs, and the detection of the meaning of photographs taken from the air—a wonderful science in itself, which would, I am certain, fascinate any Member who had time to go and see even what its general scope is.

### UXBRIDGE.

"At Uxbridge is the Air Force depot, and here we have a physical training school. At Salisbury and Farnborough artillery and infantry co-operation are taught to work with the aeroplanes of these two other Forces. At Calshott, air navigation over the sea, long-range flights by the stars or by other methods, and seaplane flying. At Felixstowe, and Leuchars, in Scotland, are stations where the co-operation of the Navy is carried on.

"Then there are the great experimental stations at Martlesham, Grain, and Biggin Hill. Then there is the Royal Aircraft Establishment at Farnborough, an institution most vital for the general development of flying. There is a research laboratory with schools for medical officers at Holly Hill, to enable them to study the medical problems which are peculiar to aviation.

"There are a whole set of medical problems peculiar to aviation, which comprise the effects on the human being of the different altitudes, and an infinite study of the kind of tests to which recruits and would-be pilots are subjected before you can be sure they will stand the particular strain to which they will be subjected without risking their lives and the lives of others dependant on them. Lastly, there are courses of general instruction which we have arranged at Cambridge, Oxford, London, Capetown, and Sheffield in the great universities in these cities. These courses deal, firstly, with the theories underlying aviation, and, secondly, they provide specialised engineering instruction."

### A TECHNICAL UNIVERSITY.

He devoted some time at this juncture to praise of the Royal Air Force as "a great technical university for the

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*Major C. C. TURNER,*
*Manchester Guardian, 25 11.20.*

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nation with the glamour and traditions of a gallant Service superadded." He said that the best type of pilots and of men were now coming into the Service.

The whole system, which had just been brought into being at the cost of great effort on the part of those responsible, had now reached the point in its development where it would be possible to do it the greatest amount of harm in the shortest possible time.

### Newspaper Agitation.

"Now is the time when a change of policy would more completely and more easily and more swiftly throw away the work that has been done. Now is the time when those who never can pursue a single object for more than a few months or even a few weeks together and always come hurrying forward with new projects and wishing to scamper off with raucous cries in pursuit of some new hare, now is the time when such persons will find an irrespective temptation to destroy this nation's organisation just as it is reaching effective, but still juvenile, life. Two years of consistent policy in the Royal Air Force? Why, how shocking! One can imagine them saying, 'Is it not time that we had a new stunt?' You could not have a better moment for the impatient and shallow element in public thought and public expression to swoop down upon this highly complicated and very delicate organisation and break it all up," [Can it be possible that the right honourable gentleman was thinking of the Lord Northcliffe and his gilded staff?]

### Service Squadrons.

In regard to existing service squadrons and those to be formed in the next year he said:

"There are 28 fully-formed service squadrons, of which six are in Egypt and Palestine, five in Mesopotamia, eight in India, one on the Rhine, one at Malta, the last not yet fully equipped; thus 21 out of the 28 squadrons are overseas. The equivalent of three more squadrons are in Ireland, three are working with the Navy, while one is employed at home in giving refresher courses to pilots. The four additional squadrons which are the residue of the five sanctioned by the House a few months ago will begin forming on April 1st, and that brings our total up to 32. These additional squadrons are wanted in many directions. They constitute the only reserve for all contingencies that we possess in the flying service. These fighting squadrons and training establishments comprise 2,900 officers, about 25,000 men, with a certain number of civil assistants. That is the Air Force upon which, rightly or wrongly, we have been labouring for the last two years.

### Economies.

"I think there is a possibility in the future of a higher degree of economy being achieved through our being able to make squadrons undertake more of the work of the training establishments. But we have not yet been able to do that because, firstly, the squadrons have themselves been forming, and, secondly, because all these squadrons have been engaged in actual fighting, or in operations which have many of the unpleasant elements of actual fighting, during the currency of the last twelve months. In addition, we propose this year to begin the formation on a very small scale of a Territorial Air Force, for which £20,000 is taken in the Estimates.

"Our idea is to have six squadrons, stationed near centres where there is a large engineering population, and where aerodromes are available. Each squadron would have a small nucleus of regular air mechanics, and it is hoped that the skilled voluntary element in the neighbourhood will form this small nucleus."

### Expenditure.

From the discussion of concrete fact he changed to the defence of expenditure on the Air Force. He pointed out the absolutely essential nature of the Royal Air Force as one of the defensive forces of the Realm, and said in essence that despite the high value of civil aviation in the country it would be criminal folly to neglect to maintain an adequate military aerial force. The criticisms to which he was referring were obviously those of the *Times* and the *Times* group of newspapers. Sooner or later he was sure that when powerful nations revived there would be rumours of great aerial development in Germany or Russia, and that consequent on them there would inevitably be a leader in the *Times* condemning the Government for neglect of aerial preparations.

The present cost of the Royal Air Force, which might be between £15,000,000 and £16,000,000 a year, was after all only equal to £7,000,000 or £8,000,000 a year in the pre-war value of money. He attacked the stupidity of newspapers who made comparisons between the present cost of the Air Force and the pre-war cost of the Army, obviously to the disadvantage of the former.

### Civil Aviation.

He then turned to the question of civil aviation, and I give in full his remarks in this matter.

"If there are to be great developments in civil aviation at Government expense the additional money must be voted by Parliament for that purpose. I should, of course, be delighted to receive from the House and from my right hon. friend the Chancellor of the Exchequer, larger sums of money for civil aviation, but in view of the grave financial stringency I do not feel justified in asking at present for more than the £1,000,000 a year which we are spending Properly used, a great deal ought to be accomplished within the limits of this £1,000,000. We must do everything that is possible to help those who have it in hand. They have a very hard task to perform, and they have shown great courage and persistency and perseverance in their discharge of it. I think, however, that in view of the limited sum which is available it will be necessary to go on concentrating on a few routes and a few services to make sure that they are established and maintained, rather than to spread out your contributions on plans of a general character, not one of which can be carried more than half-way to success.

"Last year the Admiralty reached the opinion that, as the need for economy was so great, we could not afford to develop both airships and aeroplanes for naval purposes, and that we had better give up the airships and concentrate on the aeroplanes. It was a melancholy decision, when you consider that, as a result of so much expenditure, we had almost reached the first place in the world in the construction of rigid airships. But I think it was a wise decision. It seems to me very probable that that will involve the abandonment by the Government of airship building in the civil sphere. We have hitherto been engaged in completing airships under construction when the War ended, in experimenting with those ships, and in building a new ship for the United States, for which we receive a sum of £500,000, owing to the enterprise and commercial activity of my right hon. friend, in training their crew in the handling of this ship, and in carrying out certain experiments with mooring masts which are of great interest and importance. Unless, however, within the next few weeks private companies are willing to come forward and take over the airships and run them for commercial purposes, I shall not feel justified in continuing expenditure upon airships for civil purposes. If any company will come forward and give a reasonable undertaking to operate the vessels and to continue to experiment, they shall have all our airships free of charge, together with all the spare parts in our possession, and the necessary ground establishments. They can have them as a free gift, with any assistance that we can give, if they care to come forward. More than that we cannot do. There is nothing new in this. During the whole of this year we have been trying to induce commercial firms to come forward and take over the airships on very favourable terms, and I trust that in the next few weeks some proposal which can be taken up will be made to us.

"The task of fostering civilian aviation in the British Isles will be attended with much difficulty. The fogs and mists and other climatic conditions are a terrible hindrance. Moreover, the country is covered by a network of railways and roads which constitute a most formidable competition with the air. Travelling by air does not mean travelling from one city to another, but from one aerodrome to another; the aerodromes are on the outsides of the cities, and it usually takes from 15 to 30 minutes to reach or return from an aerodrome. Then you have to compete in an aeroplane with trains which carry passengers into the heart of the cities, and with motor-cars which take them actually from door to door. If you add to that the danger and uncertainty induced by climatic conditions, it will be seen that we are much less favourably circumstanced, so far as domestic civil aviation is concerned, than countries like France, Italy, Spain, or, I dare say, the United States of America.

"Therefore, I should not expect to see a very large or a very rapid development of domestic civil aviation within these islands. I think the Government might easily pour out very large sums of money with that object, without achieving any permanent result.

"There is, however, one route which we should keep open, and which certainly offers superior prospects of success. I mean the air route from London to Paris and the Continent generally. Here the British aeroplane, although still hampered by the weather conditions of these islands, has the enormous boon, the almost inestimable boon to bestow on a traveller, of eliminating the crossing of the Channel with its attendant delays and discomforts. It is not simply the inconvenience of the sea voyage which will be saved, but the long delay which takes place both before and after the passage. There is no more striking experience than to travel by air from London to Paris for the first time to one having been accustomed to make many laborious journeys by rail and sea. One really has a sense of enchantment when, in less than two hours, almost before one would have reached Dover, there is the beautiful city of Paris, with the Eiffel Tower and the Golden Dome of the Invalides, revealed in the sunlight far below. I cannot conceive that with a sustained effort to popularise this service it will not succeed, at any rate during the summer months. I think we should concentrate upon this now, when our funds are so limited, instead of dissipating our strength in enterprises which we may not be able to carry through.

"The Chancellor of the Exchequer has accorded to the Air Ministry a very wide discretionary power in the spending of the £1,000,000 allocated to civil aviation, provided that the total is not exceeded and that no commitment is made which involves future increases on the £1,000,000. The sum of £60,000 is included in the Estimates for subsidies to civil aerial transport firms, and this was based on a scheme proposed by Lord Weir's Committee for subsidising such companies to the extent of 25 per cent. of their gross earnings. Now, however, that the French Government have decided to grant to their own companies assistance on a most generous scale, I fear that if we adhere to the scheme of Lord Weir's Committee our firms will be so heavily undercut that there will be no encouragement for British lines to continue.

"I propose, therefore, to set up immediately a Committee, including members of the aircraft industry and the aerial transport firms, to devise the necessary alternative methods which will meet these changed conditions, and to make proposals for immediate action. If a saving can be effected on other parts of the civil aviation Vote the inducements we now offer will be made much greater. More than that I cannot say at present."

### Garrison Duties.

From civil aviation the right honourable gentleman travelled to the possibilities of the replacement of Naval and Military units by Air Force units where such arrangements appeared possible. He protested against the idea that the Air Force was simply an addition to the pre-war Army or an extra burden on the taxpayers of the country. He was sure that the time would come when, properly handled and developed, the Air Force would be a substitute, to a very important extent, both for soldiers and ships. Even at the present time he was convinced "that the Air Force had it in its power very sensibly to reduce the price and costs of the garrisons of certain Oriental territories for which we are at present responsible." In Mesopotamia, districts were prevented from rebellion by the mere fact that aeroplanes were patrolling over the danger areas.

In regard to coast defence the Air Force can afford a real protection in place of far more costly vessels necessary in pre-war days. Mr. Churchill is evidently no blind supporter of the theory that aircraft have already ousted the capital ship.

"So far as the Navy is concerned, it is quite true that no sensible or well-informed person contemplates the Air Force being able in the next five or ten years to take the place of capital ships that have formed the British line of battle on sea. Harm is done when claims are made on behalf of the Air Force either in regard to maintaining order and security, unaided, alone, single-handed, in large disturbed countries or in regard to the prime defence of these islands and of our Empire on the sea.

"The Air Force can only at the present time act as a supplement, as an increasing supplement, but still only as a supplement to the Army and the Navy, but it should be a supplement which, from now onwards, should enable the number of types of warships to be reduced and considerable reductions to be effected in the number of troops we have hitherto employed in certain parts of the world. It may well be, for instance, that the capital ship will be increasingly watched and protected by aircraft in the future instead of by the larger number of small vessels, cruisers, destroyers, trawlers, which have been found indispensable to its safety in the late war. It may well be that reconnaissance at sea by aircraft may be found a substitute for far more expensive types of sea-going ships. It may well be—this, perhaps, will be thought an extraordinary suggestion—that the submarine will find in the aeroplane another of those deadly menaces which threaten to curtail its sinister intrusion into the foundations of our naval security.

"I do not wish to prejudge those matters. Obviously, these questions of air and of naval and material are at present very largely in flux; but I am sure of this, and this is the point and the only point which I have been endeavouring to put before the House during the whole of the observations they have permitted me to address to them—this is the sole point to which all my arguments, from whichever quarter they have originated, have been directed—I am sure that to scrap and break up the Air Force which has been created laboriously, which has just reached the effective stage, would not only rob you of an essential and vital means of defence, but will also cut you off from the possibilities of future reductions in the other services through the substitution of air power for man power and for sea power, which reductions may indeed be an essential part of our future security."

### The Future of the Air Ministry.

Referring to the future of the Air Ministry, he thought that Mr. Bonar Law would be able to deal with the matter better. He could not make out a case for himself. "It would be difficult to do justice to the subject." (Here there was laughter.) Mr. Churchill was ready to hand over the seals of the Air Ministry at any moment that it might be found convenient to create a new Secretary of State for Air with a separate seat for the Cabinet. In the meantime he hoped the House would support him while he remained.

### Major-General Seely.

He was followed in debate by Major-General Seely, who lamented the fact that the same gentleman who was Secretary for the Colonies also held the seals of the Secretary of State for Air. He asked Mr. Churchill "to leave his somewhat rollicking mood of cheerful optimism and look at the bedrock facts of what has been the effect of his maladministration in the past." Mr. Churchill might think that everything was going on just as before. "So it is, but it is going on very badly."

*(To be continued.)*

## THE COMMITTEE ON CIVIL AVIATION.

The following was issued by the Air Ministry on March 7th, 1921:—

The Secretary of State for Air, when introducing the Air Estimates in the House of Commons on March 1st, stated that he intended to set up forthwith a Committee to make proposals for immediate action in regard to the assistance necessary for the maintenance of air transport on the cross-Channel service.

Mr. Churchill has appointed Lord Londonderry (chairman), Sir Frederick Sykes, and Sir James Stevenson as members of this Committee.

Several meetings have already been held with leading members of the Industry.

Lord Londonderry proposes to summon a special conference at the Air Ministry on Thursday, 10th instant, between the members of the Committee and all parties interested, when an opportunity will be given for the views of the latter to be heard.

## A LUNCH TO SIR ROSS AND SIR KEITH SMITH.

In celebration of their flight from England to Australia, Sir Ross M. Smith and Sir Keith Smith were entertained at luncheon on Thuresday, March 3rd, at the Hotel Cecil, by the Chairman and Directors of Rolls-Royce, Ltd., Shell Mex, Ltd., C. C. Wakefield and Co., Ltd., and Vickers Ltd. Mr. Douglas Vickers, M.P., presided, and among those present were Major-General Sir Frederick Sykes (Controller-General of Civil Aviation), the High Commissioner for Australia, the Agents-General for New South Wales, South Australia, Tasmania and Victoria, Sir Edward Brockman (Malay States Agency), Lieut.-General Sir A. S. Cobbe, V.C. (Military Secretary, India Office), Commandant Sablé (French Air Attaché), Lord Montagu of Beaulieu, Lord Herbert Scott, Sir William Joynson-Hicks, M.P., Major Melvin Hall (American Air Attaché), Air Commodore E. M. Maitland, Major-General E. D. Swinton, Brigadier-General Sir Capel Holden, Dr. P. Chalmers-Mitchell, Mr. H. White-Smith, Captain Stanley Cockerell, Captain F. Crossley Broome, and Mr. R. K. Pierson.

At the conclusion of the lunch Sir Frederick Sykes presented the Air Force Cross to Capts. S. Cockerell and F. C. Broome, and the Air Force Medal to their mechanics, Messrs. Corby and Wyatt, for their South African flight. He also presented gifts to Sir Ross Smith and Sir Keith Smith and their mechanics from Vickers Ltd., Rolls-Royce, Ltd., Shell Mex, Ltd., and C. C. Wakefield and Co., Ltd.

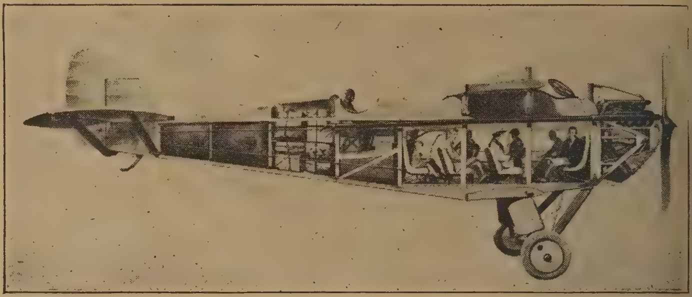
## THE ROSS SMITH FLIGHT.

At the first travelogue given by Sir Ross Smith at the Philharmonic Hall on March 7th, the Lord Morris was in the chair. The pictures were very good, and included 20 examples of direct colour photography and many sections of film taken from the machine while in flight.

## THE DEPARTURE OF MR. WINSTON CHURCHILL.

The Rt. Hon. Winston S. Churchill, M.P., Secretary of State for the Colonies and for Air, left London on Wednesday, March 2nd, for Egypt. He was accompanied by Air-Marshal Sir Hugh Trenchard, and on their arrival in Egypt they will discuss with the representative military authorities, among other questions, the possibilities of the substitution of detachments of the R.A.F. for military garrisons in the Middle and Far East.

THE
DH18



The machine which can transport 8 passengers at a gross cost of 4d each per mile.

IMPORTANT:—By GROSS COST is meant fuel, pilot, insurance, maintenance and depreciation of machine and engine, all overhead charges, and every expense involved in running an air line.

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were fitted, to the first British airship to cross the Atlantic, to the Aerial Derby winners at Hendon, 1919 and 1920, to the first aeroplane making a non-stop flight from London to Madrid, etc., etc.

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The faith of air pilots in the efficiency and reliability of B.T.H. Magnetos is fully justified.

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# AERONAUTICAL ENGINEERING

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INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

The wrath of "Strasbourg" descends upon all those—particularly a certain section of the Daily Press—who demand that a subsidised civilian air fleet shall be substituted for some portion of the existing Air Force. The technical and economic points which "Strasbourg" raises do not appear to have been given due consideration.

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Two lectures read before the Royal Aeronautical Society dealing with the use of parachutes from aircraft and with fabric for airships are briefly reported in this issue. The first-named paper raises questions of general interest and considerable importance.

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A short report of a conference held at Olympia in connection with the *Daily Mail's* "Efficiency" exhibition, dealing with aerial transport, bears closely upon the article by "Strasbourg." It will be found on page 236.

## THE PERILS OF A MISGUIDED FRIENDSHIP.

By "STRASBOURG."

To be delivered into the hands of friends whose sincerity is only equalled by the misguided nature of their activities upon our behalf is one of the most dreadful calamities which can fall to the lot of man. The more powerful, more influential and more energetic are those friends, the greater is likely to be the ensuing disaster.

That aviation to-day should be threatened by the efforts being made on its behalf by an organisation whose ill-directed efforts in the past have already done to it much harm must be regarded as the most serious of the difficulties which now beset its path to prosperity.

That Lord Northcliffe personally desires the downfall of the Aircraft Industry can scarcely be maintained. That the vast organisation which he controls should intend the agitation wherein it is now involved to have any but the most salutary results to that Industry is unthinkable.

### Of Truth Without Understanding.

There have been few voices which have so loudly proclaimed the importance to the security of the British Empire of an efficient and a well-equipped Air Force as those of this Press.

To this proclamation few will be found to object, but mere assent thereto—as to any other platitude—cannot be ascribed to wisdom. That this quality may be involved requires that the assent be a result of a full appreciation of the rôle which an Air Force may have to play in the war of the future, and of the essentials to the existence of an efficient Air Force.

### Guidance from the Past.

And upon these subjects there are certain scarcely yet forgotten experiences of the late war available for guidance.

These experiences indicate that the functions of an Air Force in war will be of the very widest extent, and that they may easily become the decisive factors of an extensive campaign.

And as to the essentials for the existence of an efficient Air Force one may seek even further for conclusive evidence. Napoleon—and he is, it is believed, acknowledged to be no mean judge even by the *Daily Mail*—asserted that an army fought on its stomach. He, like many another great teacher, spake at times in parables, and if this utterance is to be held to have any large significance it must imply that an army depends for its success primarily upon brains effectively employed in the Commissariat Department.

An Air Force, equally with an army, possesses a stomach, but however efficient may be its commissariat, it can scarcely be deemed to be an Air Force if it be not provided with certain less mundane supplies—to wit, appropriate aircraft.

And the consumption of aircraft by an Air Force engaged in a great war will in the future be a matter beside which the food supplies of an army will be an insignificant item. And not alone in regard to quantity will these demands be colossal. They will be—as it was in the late war—for continually improved types in continually increasing numbers.

Therefore the Air Force of the future will require, firstly, brains—brains of a high order, well and adequately informed in the technique of aerial design and of the art of aerial war, devoted to the problems of the prompt and accurate fulfilment of such demands. It surely cannot need now to be reiterated that it was the lack of such brains intelligently employed which caused the most distressing feature in the war history of the R.N.A.S. and the R.F.C.

And if the R.A.F. of the future can count upon an adequate and efficient technical organisation to supervise the supply of aircraft in war, what shall it avail it if it be not possessed of senior officers, trained to the use of the aerial arm, who shall be able to use the material so provided to the best effect?

And not alone are these two essential, but they must exist as component parts of a working organisation—each knowing and each trusting the other.

Beyond the organisation for the supply and the use of the actual fighting aircraft, what remains to complete the Force for the purposes of war?

The actual fighting aircraft, and the personnel to man and operate them.

### Aircraft Supplies for War.

The demands of war in regard to aircraft are now and are likely to be for many years, for the highest combination of high performance and of heavy offensive armament possible in the existing state of the art of aircraft design With this demand no considerations of cost can safely be allowed to interfere.

And there is involved no stagnant or standardised art, but one advancing at an ever increasing rate. The war aircraft of to-day are obsolete in design before their working drawings have been approved by the official experts. Yet once such drawings have been approved, the engineering resources of Britain to-day suffice to produce a thousand of the type in no longer a period than would be necessary to produce one sample.

Some war aircraft of up-to-date design the R.A.F. must possess—if only for its own education; but it would seem to be dictated by considerations of efficiency and true economy that no larger a stock should be held than is essential for this purpose or is needed to tide over the first months of an unexpected war. For otherwise that Force must either abandon its stock as obsolete before it is employed or be prepared to face war handicapped by obsolete equipment.

### The Supply of Fighting Pilots.

And little different is the case of personnel. The fighting pilot of to-morrow—as of yesterday—will require to be young, enthusiastic, and ready to face appalling personal dangers. These conditions can be met by men specially trained to the purposes of the particular war involved.

They will require the leadership of a certain number of older men, steadied by experience, but not sobered into an undue care for their own safety. Such men are not unduly common, and such men alone will it profit the Air Force to maintain for long upon its active list.

Experience has shown that the fighting pilot, like the fighting aeroplane, can be produced in quantity and in quality at very short notice if the need arises.

### THE CONSTITUTION OF AN EFFECTIVE AIR FORCE.

Can it be concluded otherwise than that the Royal Air Force in times of peace should consist mainly of a staff trained with the specific object of dealing with a vastly expanded War Force when the emergency arises, combined with a nucleus of fighting formations sufficient to provide the backbone of trained officers and men which will be needed to stiffen that force in its expanded form?

Can one conclude that the principles which war has proved to be sound in the case of an army cease to be valid when applied to an Air Force?

### THE ALTERNATIVE WHICH IS OFFERED.

Yet consider that policy which the *Times* and its lesser associates would advocate.

Some large portion of the current estimates for the Royal Air Force should, they affirm, be diverted from the uses of that force. Of those estimates of some £18,000,000 a bare £3,000,000 is devoted to the supply of technical and warlike stores, and a further £1,000,000 to the purposes of research. Clearly, little can be pruned from these sections without endangering either the adequacy of the Air Expeditionary Force, or the progress of war aircraft design.

And therefore such pruning as is to be done must be done at the expense of the organisation of the Force itself. Is the Air Force, then, to be starved in its brain? Surely Lord Northcliffe does not propose to abandon his Press?

And in return what is to be gained? A vast reserve of subsidised aerial merchantmen—manned by commercial pilots, it is alleged.

### THE MATERIEL OF A COMMERCIAL AIR FLEET.

Are these aerial merchantmen to be reasonably efficient as commercial carriers? If so, is it not obvious that into their design must enter as a primary factor the consideration of cost, both of manufacture and of operation, with performance as a secondary object? Will it be economically possible to introduce into this commercial air fleet each and every improvement tending to increase their powers of offence which military aeronautical science can devise?

And, if not, will they possess more than the most ephemeral value as weapons of war?

Alternatively, are all economical considerations to be sacrificed to their potential use for the purposes of war? Who, then, will estimate their value as commercial craft?

Would even Sir Percy Scott suggest subsidised canal barges as a substitute for the Royal Navy, or capital ships for the uses of Inland Water Transport?

### AND ITS PERSONNEL.

And in regard to personnel. Consider the attributes necessary to success as a pilot of commercial aircraft. Will it not be the duty of all such so to navigate and handle their craft that the craft, their crews, and their cargoes shall travel with the maximum of security and safety? Can it be supposed that it will be other than their plain duty to avoid in each and every possible way all unnecessary risks to all that is confided to their charge? And is the practice of such a profession likely to encourage the cultivation of those qualities of dash and enterprise which will be needed in the fighting pilot? Some few there may be capable of combining the two sets of qualities and of exercising the one or the other at need with a wise discretion. But the majority?

### A RATIONAL FOUNDATION FOR A RIDICULOUS POLICY.

Yet, despite the ridiculous nature of the scheme, when it is considered in any detail, there are certain grounds of reason underlying it. Hence the danger thereof.

Devoid of any Aircraft Industry other than that which can be supported in peace time by the Air Force, a limit will be imposed upon the rate of progress in aerial research and invention by the limited expenditure which that Force can allot to this purpose. Therefore, without a commercial air fleet in being, British progress in aircraft design and construction cannot but be retarded.

Whether the next great war be purely war in the air or whether armies and navies survive to participate therein, the rapid transportation of men, of stores, of food, of ammunition, behind the actual fighting lines will be of primary importance. Is it imaginable that the Air Force of the future will be able to afford to rely upon horse or any surface-type transport for its supplies in war? Can even our Navy rely upon sailing ships for the transport of coal to its bases?

In the event of war between nearly equally matched forces of the future, will not the efficiency and the capacity of the rapid transportation services behind the forces actually engaged be a factor largely determining the issue of defeat or of victory? And can it be doubted that a well-organised civil air fleet will be an asset of primary importance in war?

### THE ESSENTIALS OF SECURITY.

And from this the conclusion becomes irresistible that this Empire needs—and must have if it is to retain a semblance of security from attack—a fighting Air Force organised upon such lines as have above been set forth. And, behind that Air Force and additional thereunto, a commercial air fleet as efficient and as important in its own sphere as was our mercantile marine in August, 1914

### OF THE DANGERS OF SUBVENTION.

There is here no question of whether this realm can *afford* to subsidise on such a scale as will suffice to produce this commercial fleet. It is an essential to its security that it possess that fleet.

There is some very considerable question whether subsidisation has ever yet produced any strong healthy and self-reliant industry. And no other type of industry will here avail us. Can Britain face the possibility that subsidy here will produce results as evil as it has elsewhere?

But it is no matter for dispute that if such an industry can develop to prosperity upon a self-supporting basis, it is likely to possess the attributes of vigour and of enterprise to a larger degree than has ever yet been possible under Governmental subvention and its inevitable sequel, Governmental intervention.

### IS SELF-SUPPORTING AIR TRANSPORT IMPOSSIBLE?

Can commercial aviation be made to pay without subvention?

In reply, apparently, to some challenge which has not itself appeared, Mr. Holt Thomas now admits ("Times," March 1st) that it could, were it not for the subsidised competition of French concerns. Let Mr. Holt Thomas's qualification be afforded due consideration.

### CONCLUSIVE (?) EVIDENCE.

What is the evidence that British commercial aviation cannot exist in the face of French competition unless subsidised upon nearly equal terms? Is it conclusive evidence to this effect that air lines which have had to bear the very heavy operating costs involved by an air speed of 100 miles per hour, have failed to compete with subsidised lines run at a very much more economical air speed?

Is it of any value as evidence of anything upon earth—except that faulty management is no aid to success—that a line has failed which bore the costs of such a speed as 100 miles per hour, yet only gave to its passengers a service at an effective speed of 60 m.p.h?

Yet this is the type of evidence relied upon A minor calculation will serve to render clear the point. From London to Paris is 210 miles. From Croydon to Le Bourget by the route flown in practice is about 250 miles. At 100 m.p.h.—2½ hours. To reach Croydon from London, and Paris from Le Bourget, requires a further hour—total, 3½ hours. 210 miles in 3½ hours —60 m.p.h. Yet are we continuously assured that it is idle to think of air transport except in terms of 100 m.p.h.

### CONCERNING FIGURES AND MEASURES.

To the philosophical mind this obsession for fair round figures may prove of interest. Mr. Holt Thomas and his co-thinkers are afflicted by the lure of the 100. So also are their French competitors, and it is but the unkindest of misfortune that has handicapped Mr. Holt Thomas by attaching to this pleasing numeral in his case that curious British suffix, m.p.h., and has left to his French confrères the obvious alternative of km.p.h.

Will it prove the final blow to our antiquated system of weights and measures that the use of metric units by our rivals in the great transport industry of the future should have led to the choice by them of a standard of speed only 62 per cent. of that adopted by the British pioneers, and have thus committed them to running costs which should be only between ⅓ and ¼ of those attendant upon the higher speed?

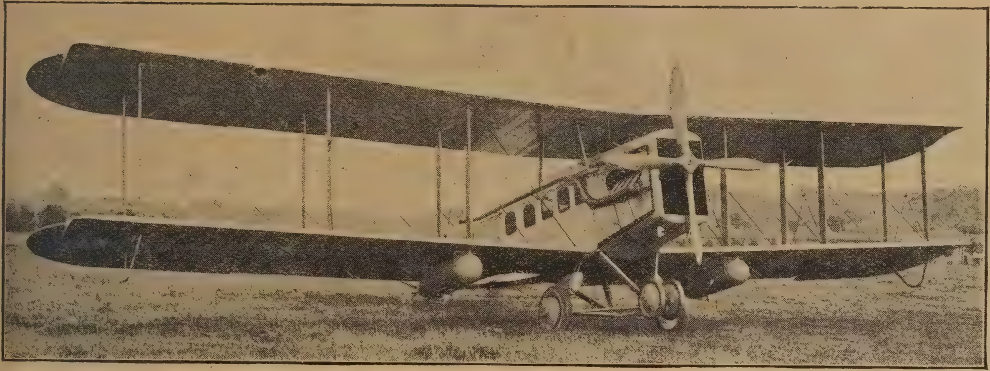
### OF THE PECULIAR VIRTUE OF THE LONDON-PARIS ROUTE.

Even if it be admitted that evidence overwhelming and conclusive can be brought to show that British services between London and Paris cannot be made self-supporting at present, is this evidence conclusively to the effect that no British service can be made to pay upon any route? Is London-Paris or even England-France the only possible scene for British aerial development? Or do the French subsidies cover all the possible alternative routes?

Upon the question of the peculiar position of the London-Paris route there exists, fortunately, some evidence backed by Authority :—" . . . . the route between London and Paris is the most difficult in the world." So runs the statement of an editorial article in the *Times* of March 1st.

Devoid of such Authority, one had hesitated to put the case so high. One had preferred to suggest merely that economic

# WESTLAND



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Travellers by Air demand the **Best**, the most **Reliable** and the most **Comfortable** machines. **The Air Ministry Competition** ***has proved*** that **we** have them.

## WESTLAND AIRCRAFT WORKS

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considerations seemed to indicate the London-Paris route as one of those the least likely to provide a steady flow of remunerative traffic during the earlier stages of its development, and that these considerations, added to certain others of a topographical and climatic nature, should have been an inducement to the study of alternatives.

But with expressions of profound gratitude let us accept as final the statement of the *Times*. Can it be said that the evidence is conclusive that unassisted commercial aviation cannot prosper when that evidence is confined to operations upon "the most difficult route in the world"?

### TWO FINAL QUERIES CONCERNING AVIATION.

And if the evidence is inconclusive—as it must surely be held to be—is it to be considered that it will conduce to our national safety to deprive the Royal Air Force of much-needed supplies in order to subsidise an inefficient and economically unsound adventure in Civil Aerial Transport?

Further, does it seem likely to inspire in the breasts of those who influence and control the finance of Industry that confidence in the future of the Aerial Transportation Industry which alone will secure for it the capital it so urgently needs, if the loudest voices in Britain continue to proclaim far and wide that Commercial Aviation can only become successful when financed out of the Public Purse?

### AND ONE CONCERNING A GREAT PERSONALITY.

In Goethe's "Faust" Mephistopheles is described as "that Power, which always wills the wrong but works the right." Is Lord Northcliffe and the organisation which he controls always to be remembered in the history of aviation as "that Power which always willed the right, but worked the wrong"?

## THE ROYAL AERONAUTICAL SOCIETY.

At the meeting of the Royal Aeronautical Society held on the afternoon of Thursday, March 3rd, two papers were read and discussed. Of these the more generally interesting was that by Major T. Orde Lees entitled "Saving Life in Air Wrecks."

### LIFE-SAVING PARACHUTES.

Naturally the lecturer was concerned almost entirely with parachutes. As to the value of parachutes the German air service's experience of the last six months of war is quoted. With a comparatively crude form of parachute, whose use was optional, though adopted by 9 out of 10 German pilots, certainly more than 50 per cent. of those who had occasion to use their parachutes escaped by their aid.

Upon the claim that passengers or pilots could only make good their exit from aircraft when that aircraft was on an even keel, and that when it was so the parachute was not needed, the case of fire in the air was instanced. Many cases were recorded where pilots had jumped from machines on fire, and if they could jump without parachutes they could do so with them.

The general argument advanced was that, if parachutes could be used in such a way as to save any lives at all, this sufficed to justify carrying them. German experience demonstrated that they could save lives, and this was an ample reason for their adoption.

An historical account of some of the early work on parachutes led up to a description of the modern aircraft parachute, and some considerable attention was given to the various difficulties of practical use from an aeroplane. The chief is that of the parachute fouling the aeroplane when the latter is in a spin, or otherwise out of control. It has been objected that parachutes of the type anchored to the machine and pulled out of their containers by the weight of the man cannot be relied upon to clear under these conditions. This is not correct provided that the container is attached to the machine by a long enough cord, as then even if the cord be wrapped partly round a spinning machine the parachute is clear before it is pulled out.

The alternative type, carried in a pack on the man's shoulder and extracted either mechanically or by a pilot-parachute, depends on the intelligence of the passenger, and is objected to on account of the weight which must be carried upon the back.

As to the type which is supposed to open and drag the passenger from his seat, it is ideal and not altogether impossible. There are serious difficulties in regard to avoiding fouling, and no data as to whether a parachute will suffice to pull its passenger clear.

The general idea that a parachute often fails to open is erroneous. During the war ordinary parachutes stuffed anyhow into Spencer cases failed to open not more than once in two hundred descents. The danger of not opening is entirely due to the suction on the central vent pulling the sides together. In the Autochute a piece of paper closes this vent and prevents this suction, to burst when the parachute is opened. In other modern parachutes mechanical devices open the mouth positively. For aeroplane work it is vital that a parachute opens quickly—within 150 ft.

The salving of passengers from multi-engined machines is the biggest problem to be solved. One solution just patented was that of a huge parachute which carries the whole passenger cabin—made detachable—the whole apparatus being operated by the pilot. This scheme required developing. It had the advantage of removing responsibility for their own safety from the passengers.

Aerial accidents could not be entirely eliminated, and every possible safeguard against them must be provided. Parachutes were one safeguard, and even if they only saved some passengers they were justified.

### AIRSHIP FABRICS.

The second paper dealt with Fabric for Airships and was read by Mr. J. W. W. Dyer. It is a technical description of the fabrics which have been tested and used in the construction of airships, of the methods of proofing and protecting them, and of the ills to which they are subject. The paper was of a distinctly technical nature and so unsuitable for abstract.

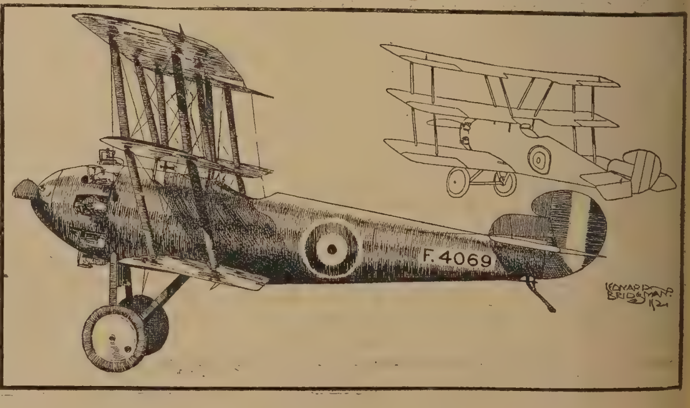
Readers of THE AEROPLANE who wish to inform themselves upon the subject will do well to acquire the paper when it is reproduced in the *Aeronautical Journal*.

## CONCERNING HELICOPTERS.

Paris, Feb. 28th.—Marquis Raoul Pateras Pescara, who has just returned to Paris, stated yesterday that the R.2, the helicopter which he expects to fly, will be ready within two or three months, and that at the end of that time he will demonstrate it in flight over a closed circuit.

The R.2 will be equipped with a 120-h.p. motor, and is expected to lift 800 kilograms, of which 150 kilograms will be useful load. This being so, the helicopter should easily carry two people.

In air circles there has been some scepticism in regard to the value of the experiments and "flights" of the French engineer Oehmichen, because he uses a balloon to help his machine into the air. The balloon has a capacity of 144 cubic metres. He argues that his machine weighs 336 kilograms, and the balloon has a lifting power of only 71 kilograms, so that his helicopter has made a direct lift of 265 kilograms.



**THE SOPWITH "SNARK."**—The sketches here reproduced are based upon illustrations supplied to "The Aeroplane" by the Directorate of Supply and Research, the Air Ministry. The "Snark" was designed for the Royal Air Force by the Sopwith Aviation and Engineering Co., Ltd., at a late stage in their history, as a single-seater fighter with a multiplicity of machine guns. Fitted with a 320-h.p. A.B.C. Dragonfly, the machine has an excellent performance, both as regards speed and climb, but appears in this respect to be slightly inferior to the "Snapper" biplane built by the same firm at about the same date.

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## NEW BRITISH AIRCRAFT.

### The De Havilland Monoplane.

It is now permissible to publish some details of the new De Havilland monoplane which, as was mentioned in The Aeroplane at the time of the formation of the De Havilland Aircraft Company, is to be the first of the new types laid down by this enterprising concern.

The period which has elapsed since that announcement has been devoted to careful and exhaustive experiment, both in the wind tunnel as to the aerodynamic features and in the laboratory as to details of construction, and a stage has now been reached at which it is possible for the firm to put in hand the construction of commercial craft of the new type.

The original design was conceived to meet the demands of the A.T. and T. London-Paris service for the expected traffic of 1921, and to provide a machine to carry six passengers at the minimum possible operating costs. This design is based upon the use of a Siddeley "Puma" engine of 230 h.p.

A further development of the same type has been evolved and is in the same advanced stage. This machine is of greater load capacity, and of a higher all round performance, and is designed for an engine of 450 h.p.

Both types embody the same general features. The single wing is of a heavily tapered form both in plan and in depth, built upon timebr and three-ply box-spars and covered with fabric. The fuselage of large cross-section entirely contains the passenger and cargo space, and carries the wing upon its upper surface. Except in regard to the wing surface no startling departures from standard D.H. practice will be noticeable.

According to a report in the daily Press this later type is to carry either 10 passengers, or 2,300 lb. of cargo, at a cruising speed of not less than 100 m.p.h., and these figures are here given without confirmation.

### The Vickers Valentia.

According to the statements of the daily Press, the Vickers "Valentia" flying-boat was to undergo preliminary tests at Cowes, in the hands of Capt. Cockerell, on Friday, March 4th.

It may be remembered that the "Valentia" was one of a number of the designs for big flying-boats designed to use the Rolls "Condor" engines which were under construction at the end of the war. Work on the completion of both machine and the engines has been carried on at a slow rate since the conclusion of peace, and the "Valentia," with at least one other design of a somewhat similar class, is now ready for test.

The "Valentia" has been built for Vickers Ltd by S. E. Saunders, Ltd., of East Cowes. The builders have been responsible for the design of the Consuta built hull.

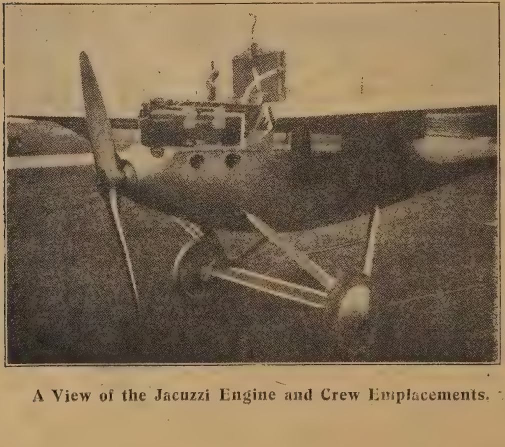
## NOTES FROM ABROAD.

### UNITED STATES OF AMERICA.

### The Jacuzzi Monoplane.

The firm of Jacuzzi Bros., Inc., of Berkeley, Cal., are responsible for the construction of a seven-seater monoplane, designed for passenger-carrying and commercial purposes.

By the use of external bracing it has been possible to use a comparatively thin wing section with a consequent high maximum L/D at low angle of incidence and high speed. The wings have a very pronounced taper when seen in plan and thicken towards the roots, the centre section being very carefully streamlined into the top of the fuselage. The internal wing construction is of wood, the main spars being of generous proportions, and in addition there are twelve additional strips that connect up the ribs and add to the rigidity of the structure. The external bracing is by two Y struts of aerofoil section, one on either side, running from a tie-rod in rear of the landing-wheels to a point about two-thirds out on the wing, being there attached to both front and rear, wing spars by a heavy metal fitting. Ailerons are placed on the trailing edge of each wing tip, and are operated by a system of tubes and cranks.



A View of the Jacuzzi Engine and Crew Emplacements.

The fuselage is of approximately circular section, and is made up of six main longerons 1⅝ in. by ⅞ in., supplemented by eighteen auxiliary longerons ⅞ in. by ⅜ in., all supported on a series of 14-ply formers, the whole being covered by a ¼ in. plywood covering. An aluminium casting finishes off the rear of the fuselage, and contains the bearings for the rudder and elevators.

The cabin is situated directly under the centre-section and contains three seats, the front one holding two people, the middle one three, and the rear seat two people. Single or dual stick control and two sets of interlocked rudder bars are fitted to the front seat

The engine, a 200 h.p. L.6 Hall-Scott, is carried in the nose, and ample precautions have been taken to ensure safety from fire.

Petrol is carried in wing tanks, wind driven pumps ensuring a constant gravity head at all fuel levels. The radiator is carried on the leading edge of the centre section and is fitted with a canvas roller-blind shutter.

The undercarriage is of usual form and consists of two ash streamline Vees connected to the fuselage by ball and socket fittings, and carrying at their apices a two-inch axle suspended on rubber shock absorber. Streamlining in the form of an aerofoil is carried between the axle and the tie-rod that connects the wing bracing-struts. A tube passes through the left-hand vee, and serves as a step to gain access to the cabin. The tail skid is a curved leaf-spring.

In flight the machine has given every satisfaction, it having been easily recovered from a spin, as well as other positions. The wings have been found to be exceptionally rigid in flight, and the undercarriage has stood up under punishment sufficiently severe to collapse the wire wheels.

Specification.

| | | | |
|---|---|---|---|
| Length | 29 ft. | Speed (¾ throttle) | 125 m.p.h. |
| Span | 52 ft. | Landing speed (full load) | 45 m.p.h. |
| Height | 10 ft. 6 in. | | |
| Area of wings | 400 sq. ft. | Landing speed (½ load) | 38 m.p.h. |
| Weight (empty) | 1,800 lb. | | |
| Weight (loaded) | 3,400 lb. | Ceiling (approx.) | 22,000 feet |
| Fuel capacity | 80 gall. | | |
| Oil capacity | 4 gall. | Radius of action | 900-1,000 miles |
| Speed (½ throttle) | 100 m.p.h. | | |

### ITALY.

### The Giant Caproni.

It is reported that the new eight-engined Caproni triplane has been essayed upon Lake Maggiore, under the control of Signor Colombo. No attempt has yet been made to take the machine off, but merely to obtain the general feel thereof and to test controls, etc.

The pilot reports the machine to promise well.

Later reports indicate that on March 2nd a successful straight flight of approximately one mile was made, carrying 1¼ tons of ballast. On March 4th a further flight resulted in a bad alighting and some damage to the hull.

### The Need for a Small Engine.

The Italian National Aerial League (the L.A.N.) is putting up a prize for a small aero engine not to exceed 50 h.p., to be fitted with independent dual ignition and a dual oiling system, both of which are to be capable of being made use of at the same time. Also the engine has to be made proof against water or other impurity of petrol supply, and have dual controls and dual distribution gear. Devices against loss of power at high altitudes are permitted, but not essential, as is the weight limit of 2 kilograms per h.p.—J. S. H.

### GERMANY.

### The Soaring Flight Competition, 1921.

The gliding and soaring flight competition which was held in the summer of 1920 in the mountains of the Rhön (The Aeroplane, Oct. 6th, 1920) is to be followed by a similar competition in 1921. This competition will be held under the patronage of the "Wissenschaftliche Gesellschaft fur Luftfarht" (Scientific Society for Aeronautics), of Berlin, and will be managed by the League of German Model Aircraft and Gliding Clubs. The whole aim and object of these competitions is the experimental development of flight by the aid of the internal forces of the wind—otherwise soaring flight. The subject has very considerable scientific and a distinctly sporting interest, and it is by no means certain that the results obtained will be of no practical value.

At least a practical solution of the problems of soaring flight will save the harassed editors of aeronautical journals from the onslaughts of those who conceive themselves to have discovered the secret of the flight of birds.

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GREAT STABILITY.
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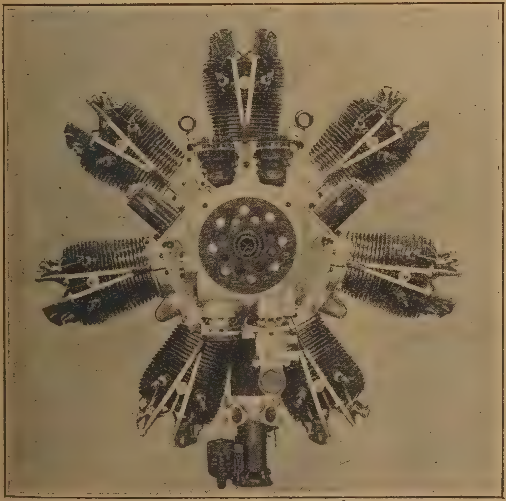

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*Godbolds.*

It is desired to ensure as far as possible that continued progress be made in the art of soaring, and at the same time to encourage the sporting interest in the competition. The meeting is to take place in August, 1921, at the "Wasserkuppe," the scene of the 1920 meeting.

It is proposed to award the first prize for the longest duration of glide attained at the meeting subject to the duration thereof exceeding 5 minutes, and to the difference of level between starting and alighting points being not more than 50 metres.

That is, the prize will only be awarded provided that a considerable advance is made upon the 1920 results. Other prizes are to be awarded for the glider which glides for the greatest distance, and for that which shows the slowest rate of a descent. A number of other prizes are at the free disposal of the judges. The total prize fund is 100,000 marks, and the first prize—for the longest duration—is to be 30,000 marks.

Believing that the problems of soaring flight have a more than national interest, and that international co-operation in the matter will lead to a more rapid and complete solution thereof, the promoters have decided that this contest shall be open to all nationalities, and would-be competitors may obtain full information as to the conditions of entry from the offices of "Rhön-Segelflug Wettbewerb, 1921," Frankfurt-on-Main, Bahnhoffplatz 8.

Recent experimental work with gliders in Germany has, it is stated, produced remarkable results, in particular in tests made by Herren Peschke and Wenk in the Black Forest, and by Herr Harth. The latter has made flights of up to 5½ minutes in duration, accompanied by very slow rates of descent, and it is expected that the 1921 competition will produce really surprising results.

It is stated that the enormous amount of interest taken in Germany in soaring flight is the direct result of the destruction of aeronautical stores under the conditions of the Treaty of Versailles, and that devoid of the opportunities of experiment with power-driven aircraft. German enthusiasts have turned their attention to a branch of aeronautics for which no one else has time to spare.

## THE "DAILY MAIL" AND AIR TRANSPORT EFFICIENCY.

In connection with the so-called "Efficiency" Exhibition run under the auspices of the *Daily Mail*, a series of conferences have been held daily dealing with the various aspects of the misuse of this blessed word. On the morning of Friday, Feb. 25th, such a conference was held upon the subject of aerial transportation.

Two papers were read, one by Mr. H. Whyte Smith, of the Bristol Aeroplane Company and the Society of British Aircraft Constructors, upon "The Efficiency of Aeroplane and Seaplane Transport," and the second by Mr. C. I. R. Campbell upon "Airship Transport."

Both of these papers were designed to impress upon business men the commercial value of aerial transport. Mr. Whyte Smith's paper was in many respects excellent, it put the possibilities of saving time very clearly, and it expressed the well-founded hope that the costs of aerial transport would fall rapidly. It suffered in that it did not indicate how the many weak points of existing aerial transport services could be remedied, and their cost at once reduced, and in the end it fell back upon an appeal for Government assistance.

Mr. Campbell's paper was wholly admirable as showing the potentialities of rigid airship services for long-distance passenger and mail services. He gave estimates—based on those of Air Commodore Maitland—showing that airship transport charges would compare very favourably with first-class steamship fares to Egypt, India, the Cape, and Australia, and that the saving of time possible was really enormous.

The papers were followed by a sort of discussion wherein there was but one bright spot, Major Hardie's indignant protest against air transport.

General Sir Sefton Brancker spoke in more than usually pessimistic terms. Alluding to airships, firstly, he trotted out the old fallacy that speed *per se* had some mystic value of its own, and said that he did not believe airship speeds were high enough to be of any value. He enlarged the fallacy to beyond the limits to which it is usually extended, after remarking that the amphibian was also too slow for real use, because high speed meant economy, as it meant less time spent in flying, less weight of fuel to be carried, and consequently more useful load capacity—statements which may somewhat startle aircraft designers. He said commercial aviation could pay if it could get traffic. It did not pay now because the Government had done nothing to help it till too late. Nothing but Government assistance on a large scale would now suffice.

A speaker whose name could not be discovered then discussed the safety, reliability and comfort of airships. He made the very sound point that the war-time spectacle of a Zeppelin in flames no more reflected upon the safety of commercial transport than did the war-time case of merchant steamers sunk by gun or torpedo. Thereafter he divagated to a reference to German investigations, purporting to prove the immense commercial superiority of airships over aeroplanes.

Major Hardie then made his protest against the advocacy of purely luxury forms of transport under the guise of a commercial enterprise. He asserted that all estimates of costs so far put forward would prove fanciful, because of the enormous capital cost and short life of the craft employed. He registered an emphatic protest against the grant of Government subsidies to a useless luxury when the Government had only put obstacles in the way of the development of such real benefits as railways and canals.

After very brief replies from the authors of the two papers, Major Sir J. L. Baird, the Chairman, moved a vote of thanks to Mr. Whyte Smith and to Mr. Campbell. In so doing he harped upon the necessity for finding long-sighted capitalists who would put their money in aviation as they might put it into a hospital—looking for no immediate return. It was not to be expected that the Government could do that; it could not be afforded, and therefore private capitalists must be found. He thought capitalists from the Dominions might properly be expected to take a share.

Except for Mr. Campbell's paper on Airships it is difficult to conceive of anything more likely to confirm business men in their apparent decision to have nothing to do with commercial aviation than the speeches made at this conference. They consisted of one long confession that commercial aviation did not pay, and that those concerned in it did not know how to make it pay without monetary grants from the Government, or charitable assistance from capitalists.

It is very nearly time that some one speaking with what will pass with the public for authority announces the truth, that commercial aviation has not paid so far because practically every effort made to operate air lines has been directed by those who know nothing about the economics of transportation, and, judging by some of their statements, precious little about aviation.—W. H. S.

## AIR MINISTRY NOTICE TO GROUND ENGINEERS.

### No. 3, 1921.—ROLLS-ROYCE "EAGLE" ENGINES: FITTING OF EPICYCLIC GEAR. (328464/20.)

It is hereby notified:—Rolls-Royce "Eagle" engines fitted with high compression pistons will, in future, not be regarded as airworthy unless fitted with the modified epicyclic gear, incorporating friction damped control to the sump wheel. Engines provided with the old type epicyclic reduction gear can be accepted only with standard low compression pistons. Engines in service which do not conform with the above conditions should be modified at the first opportunity. A number of engines with the old type reduction gear have already been modified by the makers by fitting low compression pistons; such engines are stamped with the letter "K" on the name plate above the maker's name.

### No. 4, 1921.—LE RHONE ENGINES (80 h.p. and 110 h.p.): WEAK VALVE ROCKER SUPPORT. (78069/21.)

It is hereby notified:—The original type of Valve Rocker Support or Tee Piece fitted to earlier engines of the above types has been found to be weak to an extent which renders the engine unairworthy unless fitted with safety clips of sheet steel to Air Ministry Drawing No. A.B. 3634.

Such clips must, therefore, be fitted in all cases where the above type of Valve Rocker Support is fitted. In fitting these clips care must be taken to ensure that the holes for the pins through the fins on the cylinder heads are drilled in such a manner as to prevent the clips tearing away.

The defective type of Tee Piece in some cases has been further weakened by the drilling of a tommy-bar hole at right angles to the housing of the horizontal bearing, and in all cases may be readily recognised, as the vertical stems are tapered instead of parallel.

This type should be replaced at the first opportunity by the English type, which has a parallel vertical stem drilled with a 10 mm. hole.

### No. 5, 1921.—DUAL CONTROL IN PASSENGER AIRCRAFT. (D. 38680/19.)

It is hereby notified:—1. Experience having shown that the presence in passenger-carrying aircraft of dual control, which can be interfered with by passengers, is a source of danger, it has been decided that the daily certificate required from a Ground Engineer will be held to have been given improperly in cases where an aircraft fitted with dual control is used for passenger carrying without proper arrangements being made for the prevention of interference with the dual control.

2. Suitable protection can be given by removing the control lever and by the provision of a suitable cover which will allow for the movement of the dual rudder bar, control link and cables, and by adequately protecting or disconnecting the dual ignition and engine controls.

3. This instruction is not intended to discourage the fitting of dual control, but merely to ensure that when a machine so fitted is used for passenger carrying the necessary precautions will be taken.

*N.B.—This Notice was issued in circular form to aircraft owners in October*, 1919.

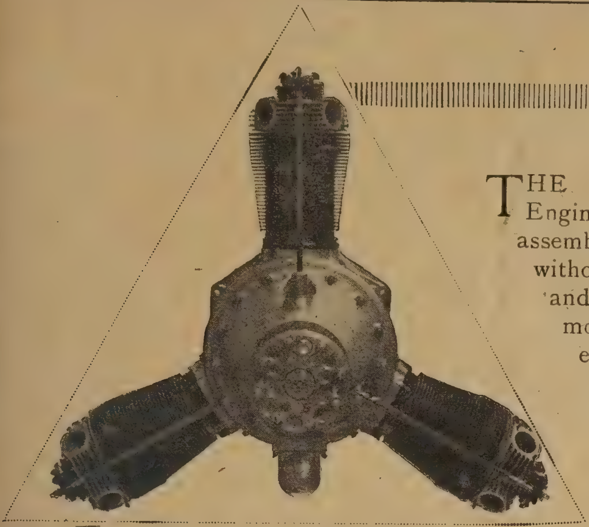
*Air Ministry*, Feb. 24th, 1921

## COMPANY NOTICES.

### Mortgages, Charges and Satisfactions.

BLACKBURN AEROPLANE AND MOTOR CO., LTD.—Debenture dated Feb. 10th, 1921, to secure all moneys due or to become due from Company to Union Bank of Manchester, charged on the Company's undertaking and property, present and future, including uncalled capital.

BOURNEMOUTH AVIATION COMPANY, LTD.—Further charge on certain properties in Dorsetshire dated Feb. 19th, 1921, to secure £426 11s. 10d. Holder, W. E. Tucker, Marlands, Yeovil.



THE 100 h.p. "BRISTOL" Lucifer Engine is of simple design, easily assembled, reliable for long periods without overhauling or dismantling, and comparable with the modern motor-car engine in all-round efficiency and reliability.

Being air-cooled it renders excellent service under all climatic conditions and for dependability and long life is unequalled amongst aero power units.

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LUCIFER AERO ENGINE

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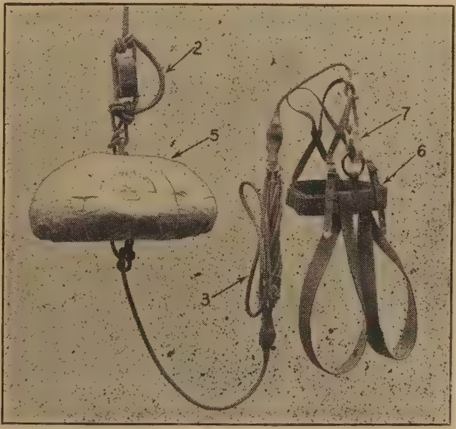

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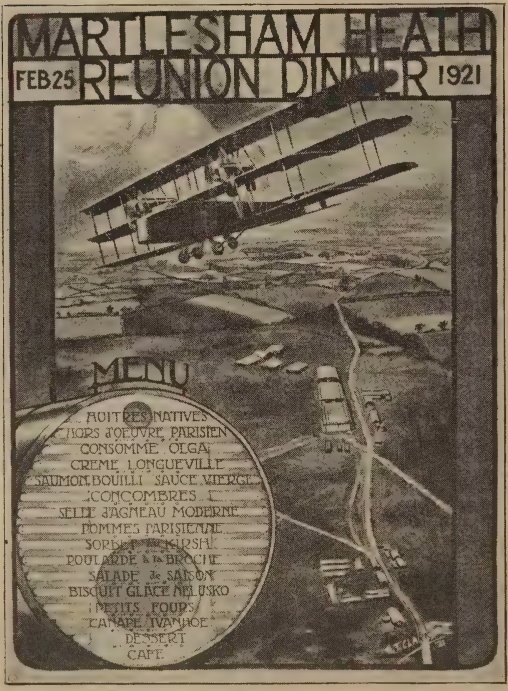
2. Connecting Shock Absorber Sling.
3. Life Line with Shock Absorber and Safety Loop.
6. Frontal Suspension Harness.
7. Schollar Quick Release.

## THE MARTLESHAM HEATH REUNION DINNER.

The reunion dinner is becoming almost a regular feature in service and ex-service circles, and these functions are never allowed to flag in fun or fail in friendship. The Martlesham Heath Experimental Station reunion dinner was a case in point. Held at the Café Royal on Friday, Feb. 25th, under the distinguished chairmanship of Air Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., R.A.F., this function proved an unqualified success.

After the loyal toast by the chairman, Squadron Leader Vernon Brown proposed the toast of the "C.Os. past and present" and in a well-chosen speech traced the influence and activities of each commanding officer since the station was created. He dwelt, it seemed, almost lovingly upon the personal peculiarities of one of the C.Os. and coupled his name with the late Gordon Bell and Lieut-Col. Travers, all of whom have been handicapped in the full expression of their opinions by some physical attribute. Whether this was due to the kind of aircraft which the designers of the nation were wont to dump on the experimental people—enough to take anyone's breath away—or merely a physical syntony with so many misfiring engines—did not transpire. In reply Squadron Leader Hubbard, after "popping" a bit on the ground, got into flight—and a good flight, too—doing full revs and diving suddenly upon the Director of Research, at whose hands he laid the blame for the allocation of the reply, asserting that General Brooke-Popham had a grudge against him for trying to break the General's neck on a Henri Farman in the wild and windy days of piano wire and praps. After a verbal spiral or two, "Mother" Hubbard effected a perfect landing and was once more taken over by the handling party.


MARTLESHAM HEATH
FEB 25 REUNION DINNER 1921
MENU
HUITRES NATIVES
HORS d'OEUVRE PARISIEN
CONSOMME OLGA
CREME LONGUEVILLE
SAUMON BOUILLI SAUCE VIERGE
CONCOMBRES
SELLE d'AGNEAU MODERNE
POMMES PARISIENNE
SORBET au KIRSH
POULARDE à la BROCHE
SALADE de SAISON
BISCUIT GLACE NELUSKO
PETITS FOURS
CANAPE IVANHOE
DESSERT
CAFE

Lieut.-Col. Tizard proposed the toast of the Director of Research—perhaps one of the most important "instruments" the Colonel has ever had to talk about, and General Brooke-Popham, in reply, expressed the hope that the dinner might prove to be only the first of an annual series. After reviewing the functions and achievements of Martlesham Heath Experimental Station in very complimentary terms, he said that everyone's thanks were due to Captain Robinson, who conceived the idea of the dinner and worked hard to make it a success. When the noise had subsided "Robby" made a very short straight and said he hoped that next year's dinner would be equally successful.

Squadron Leader Brown then sang and Flight Lieut. Pizey made noise on a banjo, accompanied by Flying Officer Wallwork, and Flight Lieut. Payn gave a violin recital.

The company then continued research work with the thoroughness and application that has always been associated with Martlesham Heath. The exact order of events seems to be a little obscured at this stage of the proceedings, but it appears that after a perfectly priceless evening a number of bodies proceeded, in not necessarily a stream-line path, to a certain estaminet somewhere in ——, well, perhaps not. Sometimes one is apt to leave so treasured a possession as THE AEROPLANE lying about, and we'd just hate to be embroiled in any domestic infelicity. Martlesham Heath dinner was a "bon" success—if you don't believe me go and ask the Policeman at Victoria, who had it all from the young Captain on the suit case, whilst waiting for the Brighton Station to open its gates.

## THE ROYAL AIR FORCE MEMORIAL FUND.

A Meeting of the Executive Committee of the above Fund was held at the Offices of the Fund, 7, Iddesleigh House, Caxton Street, S.W.1, on the 17th inst, Lord Hugh Cecil in the Chair. The Members of the Committee present included, Air Marshal Sir John Salmond, Air Vice-Marshal A. V. Vyvyan, Air Commodores Brooke-Popham and Longcroft, H. E. Perrin, Esq., and W. S. Field, Esq.

Letters of regret for non-attendance were read from the Hon. Mrs. J. E. B. Seely, Sir Charles McLeod, and Mr. F. E. Rosher.

A list of donations and subscriptions received since the last meeting on Jan. 21st was submitted, and is appended at the end of these remarks.

A list of grants made since the same date, amounting to £157 11s. 8d., were approved as grants to the rank and file and their dependents.

The Secretary reported that the balance of the Royal Air Force Aids Committee amounting to slightly over £22,000 was about to be handed over for the use of the Fund, and will be a very welcome addition.

A sub-committee under the Chairmanship of Air Marshal A. V. Vyvyan was constituted to deal with proposals for assistance to the post-war Air Force of all ranks.

Considerable discussion was given to the Royal Air Force War Memorial. A site, one of three suggested by the First Commissioner of Works, and situated at Whitehall Stairs on the Middlesex side of the Thames Embankment, midway between Westminster Bridge and Hungerford railway and foot bridge, was regarded as very suitable for the purpose, and the London County Council have been asked to give the Committee the option of this site so soon as full details of the nature and form of the Memorial can be submitted to them for approval. Meantime, the Chairman was requested to consult Sir Aston Webb, asking his advice as to the form and nature of a suitable Memorial to the Officers and Airmen of the Royal Air Force who fell in the Great War.

Sir John Salmond, Chairman of the sub-committee dealing with the Vanbrugh Castle scheme for a Boys' Home, reported that the work of renovation was in progress. It should be noted that the Deed of Conveyance making over the property for the use of the Committee as a Home for sons of Airmen, has been executed by Mr. Alexander Duckham, and the benefit has been accepted on behalf of the Fund, by the Trustees, Viscount Cowdray, Lord Hugh Cecil, and Sir Hugh Trenchard.

The two houses at Ascot, namely, "Woodcote" and "Heathend," generously bequeathed to the Air Council by Mrs. M. E. Salting, and which are to be sold, the proceeds coming to this Fund for the purchase of Scholarships for the sons of deceased Officers, R.A.F., will be put up for sale by Messrs. Hampton and Sons, of 3, Cockspur Street, S.W., on April 19th next, unless in the meantime sold by private contract. A substantial sum it is earnestly hoped will accrue to the Fund from this source.

The Annual Report, the preface to which has been written by the Chairman, is in hand, and it is hoped will be ready for issue in the course of a short time.

Correspondence submitted by Air Marshal Sir Hugh Trenchard was read concerning his recommendation to the Soldiers and Sailors Families' Association, and to the Soldiers and Sailors' Help Society that they would find themselves able to include in their titles the word "Airmen." Both these organisations replied to the Air Marshal, and signified their willingness to carry this out so soon as the necessary formalities could be taken. Both these organisations have given valuable assistance to this Fund, and it is felt that the addition to their titles will be of further benefit to all concerned.

The Flying Services Fund administered by the Royal Aero Club signified their desire that now that this Fund's organisation was in working order the Royal Air Force Memorial Fund should carry out all work connected with assistance to deserving cases in the Royal Air Force.

The next Meeting of the Committee was fixed for Thursday, March 10th, at 3 p.m., at the offices of the Fund.

| | | | |
|---|---|---|---|
| Amount of donations and subscriptions announced up to January 20th, 1921 | £103,377 | 2 | 11 |
| Amount of donations and subscriptions received up to February 16th, 1921 | 1,978 | 6 | 0 |
| Total | £105,355 | 8 | 11 |

## THE AIR CONSTRUCTION SERVICE, R.A.F., REUNION DINNER.

A Reunion Dinner of officers who served with the Air Construction Service, R.A.F., will be held at the Great Central Hotel on Saturday, March 12th. Will all officers who served therewith, and desire to attend, communicate with Major Harland, Room 181, Air Ministry, Kingsway, W.C.2.

## A REWARD FOR SALVAGE.

The Air Council have awarded a silver cup and a sum of money to Mr. William Kennedy, skipper of the steam-trawler *Sea Searcher*, of Hull, and a sum of money to the mate and each member of the crew, in recognition of their services to the Royal Air Force pilot and observers of aeroplane D.H.9a 3,518, which fell into the sea off Duncansby Head on Oct. 6th, 1920.

## AMERICAN MEDAL FOR CREW OF R.34.

The Secretary of the U.S. Navy has approved a recommendation to award the Navy Cross to the members of the R.34 which made the double crossing of the Atlantic in July, 1919, under the command of Major G. H. Scott. Lieut.-Commander Z. Lansdowne, U.S.N., who made the flight with the R.34 as relief pilot, also receives the medal.

# THE NAVAL AND MILITARY AERONAUTICS.

### NAVAL PROMOTIONS.

The Admiralty announce that the following promotions have been made, to date Dec. 31st, 1920:—

Comdr. to be Capt.—James G P. Ingham, H.M.S. *Vindictive.*

Lieut. to be Comdr.—H.R.H. Albert Frederick Arthur George, Duke of York, K.G.

Engr.-Lieut.-Comdr. to be Engr.-Comdr.—Charles S. Bell, H.M.S. *Ark Royal.*

### ADMIRALTY APPOINTMENTS.

The following appointments have been made:—

Dec. 28th.—Sub Lieut. M. S. Thomas to *Argus* (on recommg.).

Surgn. Lieut.-Commr. R. N. W. W. Biddulph to *Argus* (on recommg.).

Surgn. Lieut. E B. Kelley, M.B., to *Argus* (on recommg.).

Capt. A. J. Mackenzie-Grieve to H.M.S *Vindictive*, in command, to date Jan. 1st.

Lieut. R. G. F. H. de Caen, to H.M.S. *Eagle*, to date Jan. 8th.

### EXTRACTED FROM WAR OFFICE COMMUNIQUES.

Dec. 16th.—Mosul Area.—The area Tel Afar-Zakho (west to north of Mosul) is reported by aeroplanes to be quiet.

## The Sultan of Egypt's Generosity.

It has been reported from Cairo that the Sultan of Egypt has subscribed £(E)250 to the Royal Air Force Memorial Fund.

## The Vickers "Valentia."

The first of the three Vickers "Valentia" flying-boats being built at Cowes by S. E. Saunders and Co. for Vickers Ltd. was launched on Wednesday, March 2nd, and began her test on Saturday, under Captains Cockerell and Broome.

The "Valentia" is a twin-engined flying-boat fitted with two 600-h.p. Rolls-Royce "Condor" engines. The hull, which was designed by S. E. Saunders and Co., is built entirely of "Consuta," with no internal wire bracing.

## RUGBY FOOTBALL.

### R.A.F. v. The Army.

H.M. the King, accompanied by Air Vice-Marshal Sir G. Salmond, K.C.M.G., C.B., D.S.O., was present at Queen's Club on March 5th, when the R.A.F. beat the Army by 26 points to 3. This is the first victory the R.A.F. has gained against either of the other Services, and is all the more creditable when one considers the short time the team has been in existence.

The most outstanding feature of the game was the brilliant play of C. N. Lowe, the R.A.F. left centre three-quarter. After scoring two tries in the first half, and a third early in the second half, he took the ball from an unfortunate cross-kick by an Army three-quarter and after a run down nearly three-quarters of the field scored another try. G. H. Maxwell, with some splendid place-kicking, converted four tries and in the last five minutes kicked a penalty goal. The whole R.A.F. team played good football, and although the Army put up a strong defence they were hopelessly outplayed. The R.A.F. team was as follows:—

Flt. Lt. G. M. Robb, back; Sqdn. Leader Tyrrell, Flt. Lt. Thomas, Flt. Lt. C. N. Lowe, and Flt. Lt. W. Jones, three-quarter backs; Flt. Lt. J. Russell and Flt. Lt. J. I. T. Jones, half-backs; Flt. Lts. G. H. Maxwell, S. P. Simpson, E. H. Turner, I. C. Little, and R. H. C. Usher, Sqdn. Leader W. C. Hicks, Flt. Officer W. W. Wakefield, and Serjt. T. Smith, forwards.—C. M. S. H.

## ASSOCIATION FOOTBALL.

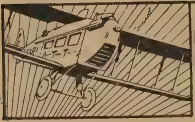
### R.A.F. v. The Army.

The R.A.F. followed up their Rugby victory at Queen's Club by beating the Army at Stamford Bridge on Monday, March 7th, by 4 goals to 2. The Duke of York watched the game and so did several thousands of the public.

The R.A.F. were undoubtedly the better team, both in forward combination and defence. On the whole, the game was not a bad one, the spell of dry weather having broken overnight and made the well-worn turf slippery, which somewhat hindered good forward play.

The R.A.F. team was as follows:—Flying Officer A. W. C. Bayes, goal; Corpl. Nicholls (Henlow) and Serjt. Fretwell (Netheravon), backs; Serjt. R. Goffin (Uxbridge), Flying Officer C. N. C. Dickson (Uxbridge), and Air Craftsman Shand (Lee-on-Solent), half-backs; Corpl. Wash (Uxbridge), Air Craftsman Ayres (Cranwell), Flt. Lt. L. H. Pakenham Walsh (Duxford), Serjt. Donald (Henlow), and Air Craftsman Barry (Cranwell), forwards.

An aerial photograph of Prague, now the capital of Czecho-Slovakia. Owing to its position in Europe, it is probable that it will become an important centre for international air lines, and has already been described as the "Clapham Junction of the Air."



# COMMERCIAL AERONAUTICS AND CIVIL AERIAL TRANSPORT.

## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### OFFICIAL NOTICES.

No. 14, Feb. 2nd, 1921.—Aerodromes for Civil use: Amendments.

No. 15, Feb. 9th, 1921.—Signposts for Airmen Additional names of railway stations now painted.

No. 16, Feb. 11th, 1921.—Aerodromes for Civil use: Amendments. R.A.F. stations may now be used with restrictions.

No. 17, Feb. 21st, 1921.—Wireless Direction Finding Stations: Organisation and procedure.

No. 18, Feb. 15th, 1921.—France—Aerodromes and Seaplane Stations, etc. Amplification of former notices on this subject.

No. 19, Feb. 19th, 1921.—Aerodromes for Civil use: Amendment.

No. 20, Feb. 19th, 1921.—Signposts for Airmen: Aerodromes, etc., marked.

No. 21, Feb. 23rd, 1921.—Radio Telephony: Stations available for Aircraft; Organisation and procedure.

No. 22, Feb. 24th, 1921.—Howden: Flying of Kite Balloons. Warning of balloon flown at Howden to assist airships landing in thick weather.

No. 23.—Belgium: Additional aerodromes and Customs facilities. Former notices on this subject amplified.

No. 24.—Lympne Aerodrome cloud and visibility signals. Explains these with details.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M): next the number of passengers: and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G. E. A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

FEBRUARY 28th:

M.A., Breguet, F-CMAF, London-Paris, 12.28-14.55, G.&M., 2, Charpentier
M.A., Breguet, F-CMAG, London-Paris, 12.29-14.55, Nil, 3, Le Men.
S.N.E.T.A., DH4, O-BARI, Brussels-London, 12.50-15.56, G.&M., Nil, Delzenne.
G.E.A., "Goliath," F-GEAD, Paris-London, 13.05-16.18, G., 1, Labouchere & 1.

MARCH 1st:

S.N.E.T.A., DH4, O-BARI, London-Brussels, 13.05-15.20, G.&M., 1, Delzenne.
M.A., Breguet, F-CMAB, Paris-London, 13.07-15.43, M., 3, Le Men.
M.A., Breguet, F-CMAH, Paris-London, 14.00-16.38, G., 3, Challoux.
M.A., Breguet, F-CMAF, Paris-London, 14.05-16.40, G., Nil, Le Sec.

MARCH 2nd:

M.A., Breguet, F-CMAF, London-Paris, 12.33-17.25, G.&M., Nil, Le Sec.
M.A., Breguet, F-CMAH, London-Paris, 12.40-17.25, Nil, 3, Challoux.
G.E.A., "Goliath," F-GEAD, London-Paris, 12.40-15.02, G., 3, Labouchere & 1.
G.E.A., "Goliath," F-GEAC, Paris-London, 12.56-16.30, G.&M., 7, Favreau & 1.

MARCH 3rd:

G.E.A., "Goliath," F-GEAC, London-Paris, 12.45-15.23, G.&M., 1, Favreau & 1.
M.A., Salmson, F-CMAE, Paris-London, 11.20-14.25, G., Nil, Charpentier.
M.A., Spad, F-CMAY, Paris-London, 12.40-14.55, M., 2, Le Sec.
M.A., Breguet, F-CMAG, Paris-London, 12.57-15.42, G., Nil, Malfanti.
S.N.E.T.A., DH4, O-BALO, Brussels-London, 12.55-09.46,/4th, G.&M., Nil, Delzenne.

MARCH 4th:

NIL.

MARCH 5th:

M.A., Salmson, F-CMAE, London-Paris, 12.44-15.53, G., Nil, Charpentier
M.A., Breguet, F-CMAG, London-Paris, 12.45-15.20, M., 3, Malfanti.
S.N.E.T.A., DH4, O-BALO, London-Brussels, 12.51-15.18, G.&M., Nil, Delzenne.
G.E.A., "Goliath," F-GEAC, Paris-London, 12.43-16.03, G.&M., 8, Patin & 1.

MARCH 6th:

M.A., Breguet, F-CMAH, Paris-London, 09.47-12.32, G., Nil, Challoux.
S.N.E.T.A., DH4, O-BADO, Brussels-London, 11.07-13.52, G., 1, Van Opstal.

### Air Port Statistics.

CONTINENTAL

Croydon.—Machines 23; Passengers, 41; Crew, 28; Total personnel, 69.

### Inland Flying at Croydon.

Feb. 28th.—Nil.
Mar. 1st.—L.A.S., DH6, Leatherhead return (Knowles).
Mar. 2nd.—I.A.L., "Vimy" to Birmingham (Barnard).
Mar. 3rd.—Nil.
Mar. 4th.—I.A.L. "Vimy" from Birmingham (Barnard).
Mar. 5th.—L.A.S. DH6 from Leatherhead return and joy-riding (Knowles).
Mar. 6th.—L.A.S. DH6 from Leatherhead and joy-riding (Knowles); I.A.L. "Vimy" joy-riding (Barnard).

### The London Terminal Aerodrome.

During the week ending Feb. 26th, the new 6-seater Spad arrived from Paris and duly returned. She is a good-looking machine nearly as big as a D.H.18, and following general Spad lines. The pilot sits behind and there is a seat beside him for a passenger, who, if he does not like fresh air, can sink into the cabin. She seems fairly fast; the main objection to her is the position of the door, which is dangerously near the airscrew.

On Feb. 25th M. Briere "wrote off" the Sneta "4" O-BABI at Addington in a fog. His two passengers were somewhat shaken, and he appeared at the Aerodrome the next day with eye "in a sling."

During the same week a D.H.9a landed at the aerodrome to adjust its aerial when on wireless test.

Large numbers of French and Belgian machines have been operating from the aerodrome, as many as seven all being lined up at a time.

Mr. Muir has now left Mr. Chapman, and has gone to the Surrey Aviation Co., who intend to have out their first Avro this week. Meanwhile it is probable that Mr. Chapman's Avro will be flown by Mr. F. J. Ortweiler, who was chief pilot to the Cambridge School of Flying, and who there established for himself an enviable reputation as a "stunt" pilot. Should Mr. Chapman manage to secure his services, there should be some excellent rivalry in "stunting" between him and Mr. Muir, since both are in a class by themselves in this type of flying.

Mr. Knowles came over on the Leatherhead "6" on Saturday and Sunday, and carried many passengers in a nasty wind.

Mr. Barnard went to Castle Bromwich with three passengers on the "Vimy" on Wednesday, returning on Friday. While there, he carried about 200 passengers in two days. He was out with the machine on Sunday, again joy-riding.

On Saturday an R.A.F. Bristol flew over the Aerodrome and entertained the passengers waiting to embark to an excellent exhibition of stunting. One wishes there would be more of this sort of thing, especially in the afternoons and on Sundays when big crowds foregather.—G. D.

### Sneta Cuts the Rates.

The Lepaerial Travel Bureau inform one that they have received a communiqué from the S.N.E.T.A. stating that their London-Brussels fare is now reduced to 225 frs. and Brussels-Paris 175 frs.

This means that, at the present rate of exchange one can now fly to Brussels for less than £5. Which is not much, if any, in excess of present railway and boat fares.

During the summer machines will stop at Ostend *en route*.

### A Correction.

In a recent note headed "Croydon versus Hendon" one said that "all the main joy-riding firms—that is, all the firms who make pleasure flying the entire source of their daily bread—are situated at Croydon."

Mr. J. D. V. Holmes, of the Berkshire Aviation Co., very rightly takes one to task for this statement, quoting a leading article in The Aeroplane referring to that company and to the Northern Aviation Co. as the main joy-riding concerns.

The note was written hurriedly, and should have read "the main *London* joy-riding firms, etc." One's apologies to the B.A.C. and the N.A.C. for the statement, qualified by the hope that when the Leatherhead Aviation Services and the newly formed Surrey Aviation Co. get an influx of joy-riders this summer there will be much competition for the title of "main joy-riding firm in the country."—G. D.

### Brooklands.

On Tuesday, February 22nd, Sir Ross Smith, K.B.E., and his brother, Sir Keith Smith, K.B.E., visited the Vickers works, where the "Vimy" was built on which the two brothers flew to Australia. They received an enthusiastic welcome from the head officials and the workpeople, the latter carrying them shoulder-high and cheering them.

Sir Ross Smith thanked the workpeople for their reception and paid a high tribute to the skill and keenness of the workers who constructed the machine for the Australian flight. He gave a graphic account of their experiences during the flight.

On the proposition of Sir Ross Smith a half-holiday was granted to the whole of the works. Later the two brothers returned to London.

The "Viking IV" is taking shape gradually, but the chief interest is now centred on the Napier "Vimy," which has been improved in one or two minor details before going to Martlesham for official tests. One is told officially that the machine is designed to carry, in addition to the pilot or pilots, a doctor and nurse, and that the fuselage contains, besides stretchers which are arranged so that the patients are always level, a small surgery, electric fans, and other conveniences. The idea is to provide rapid transport of wounded or sick men from isolated places where other forms of transport would be impracticable or slow.

The order for the "Vimy" commercial machines for China has not yet been completed.

The Napier-engined Vickers "Vimy" ambulance has had several test flights recently, and is understood to be giving satisfaction. One hears that there is a Japanese naval commander at the works, who is accumulating knowledge of aircraft and their habits, and is particularly interested in design of amphibians.—J. F. S.

### Retford.

On Feb. 23rd the Berks Aviation Co. began a flying fortnight here at a site off Tiln Lane.

Their machine arrived in the morning from Sheffield with two passengers having urgent business in Retford, the journey by air saving 1½ hours over the train service.

On Saturday a cross-country flight was made to Cranwell, the journey of 75 miles occupying 45 min. flying time.

In the last few days over a hundred passengers have been carried.

### Woking.

A few employees are working in the shops at the Martinsyde works. One is given to understand that various schemes of reconstruction are being considered, and an improvement in the position of the firm before Easter is hoped for.—J. F. S.

* * *

## FOREIGN INTELLIGENCE.

### BELGIUM.

#### An Aerial Conference.

An international conference of the principal aerial transport companies (therefore it can be presumed that no British firm was represented.—Ed.) met in Brussels on Feb. 28th and made the following decisions :—

1. To make a substantial reduction in charges, particularly in the case of passengers, so that they shall compare favourably with the maximum rates charged by the railway companies for international traffic.
2. To open on April 14th an aerial route between Paris, Brussels, and Amsterdam, with a subsequent extension to Copenhagen *via* Bremen and Hamburg.
3. To arrange for the London-Brussels service to call at Ostend during the season.

### CZECHO-SLOVAKIA.

#### The Second Prague Aero Show.

According to *Letectvi* the Czecho-Slovakian Aero Club has decided to hold the Second Annual Aero Show at Prague from Sept. 25th to Oct. 2nd

It also proposes to hold an Aero Meeting at Prague during the summer. All interested are invited to communicate with the Secretary, Ceskoslovensky Aviaticky Klub, Prague VII, Vystaviste.

#### A Height Record.

On Dec. 27th a two-seater Smolik biplane (230-h.p. Heiro), piloted by M. Jezek, with full military load (500 kilogs), reached a height of 6,350 metres, which constitutes the first Czecho-Slovakian height record. The climb to 5,000 metres took 38 min., 6,000 metres, 53 min.

"L'etablissement Aero" are also preparing one of their high-speed scouts, type 201 (220-h.p. Hispano-Suiza) in order to establish the first Czecho-Slovakian speed record.

### FRANCE.

Forty Senators accepted at short notice an invitation from M. Laurent Eynac, the new Under Secretary for Aviation, to visit Le Bourget aerodrome on Feb. 26th. The occasion was utilised as a means of instilling into the various representatives of French politics present the work of French civil aviation. M. Eynac in a short speech summed up the French air position as follows :—"1919 was a year of plans, 1920 a year of trial; and 1921 would be a year of realisation."

Col. Saconnet, Director of the Aerial Navigation Service also spoke enthusiastically of flying in France, and gave the following comparative figures showing the increase of traffic on the Paris-London, Paris-Brussels, Bayonne-Bilbao, Toulouse-Casablanca, and Paris-Cabourg routes :—

| | 1919 | 1920 |
|---|---|---|
| Miles covered | 333,823 | 989,272 |
| Complete journeys | 4,473 | 4,428 |
| Passengers carried | 729 | 6,697 |
| Goods (in lbs.) | 31,680 | 277,319 |
| Mail (in lbs.) | 1,048 | 13,581 |

For the 1,212,309 miles flown in the last two years there had been only 14 accidents and 5 deaths.

He also mentioned that one can fly from Paris to Warsaw *via* Strasbourg in 12 hours, whereas the train journey usually takes 3 days and 2 nights, and the price when one includes the cost of sleeping car accommodation is no lower than the cost of going by air, which is about £20.

#### The Grand Prix.

The following are the entries for the Grand Prix de l'Aéro Club de France, which is open for competition in three periods of three days each, viz., Feb. 20th-22nd, May 20th-22nd, and June 18th-20th : Nieuport limousine (Pilot, M. Sadi-Lecointe); Breguet, type XX "Leviathan" (Pilot, M. Roget); Breguet, type 18 (Pilot, ——); Caudron 3-engined, type 39) (Pilot ——); Farman single-engined biplane (Pilot M. J. Bernard or M. Drouin); Farman "Goliath" (Pilot M. d'Or or M. Coupet); Blériot (Pilot, M. de Romanet); Blériot (Pilot, M. Casale); Henry Potez (Pilot, M. Douchy); and de Marçay (Pilot, M. Benoit).

### ITALY.

The Italian correspondent of THE AEROPLANE writes :—

#### Italians in the Middle East.

It appears that Mario d'Urso is actually in Constantinople with two S.V.As., engaged to carry banking matter to and from Smyrna.

Also the Brindisi-Athens seaplane service is a probable spring starter, after long study.—T. S. H.

### NORWAY.

A correspondent of THE AEROPLANE in Norway writes :—

#### The Christiania Air Meeting.

Owing to the Swedish Military Department being unable to finance the Swedish military entries, and also owing to their refusal to allow the Finnish entries to fly over Sweden, neither of these countries could compete.

However, the date has been altered to March 4th-6th, and in the meantime the Swedish airmen have collected the amount required, and the Finlanders have sent a new petition to Sweden and got permission to pass over Sweden on condition that they land at Stockholm for customs purposes. —T. B. S.

### SWEDEN.

#### 20th Anniversary of the Aero Club of Sweden.

On Jan. 19th the Swedish Aero Club held its 20th anniversary The Swedish Minister of War, M. Hammarskjold, was elected as 500th member, and was presented with the Club's silver medal, presumably in honour of his lack of support to military aviation.

Nine military machines left Malmstädt in honour of the anniversary to fly over Stockholm, but arrived only six strong, although in perfect formation. This is the first time a formation of Army pilots has been seen over Stockholm.—K. F. S.

### SWITZERLAND.

A correspondent of THE AEROPLANE in Switzerland writes :—

#### La Societe Ad Astra.

Aviation in Switzerland is in a condition of almost complete stagnation. The Société Ad Astra has started the new year as it terminated the old, that is to say, without doing anything. They have acquired a new Dornier all-metal single-engined monoplane, six-seater flying-boat, which the pilot Cartier has crashed. It has been returned to the factory for repairs.—J. J. H.

### UNITED STATES OF AMERICA.

#### The 1921 Pulitzer Trophy Contest.

The Pulitzer Trophy Race will be held in Detroit on or about September 1st, and will form part of a three-day Aerial Carnival.

There will also be races for multiple-engined passenger aircraft, single-engined passenger aircraft, and a race for Navy and Army single-seater scouts. Already about 15,000 dollars prize money has been subscribed.

# AIRCRAFT IN PARLIAMENT

## HOUSE OF COMMONS.

The following written answer was given on Feb. 21st, 1921:—

### AIRCRAFT IN IRELAND.

Mr. RAWLINSON asked the Secretary of State for War whether aeroplanes are taking little or no part in the military operations in Ireland; whether their assistance would be valuable in discovering and, if necessary, breaking up ambushes; whether there is any order or regulation which hampers their use for such purposes; and whether the military authorities have full control over the use of the aeroplanes.

Sir L. WORTHINGTON-EVANS: The aircraft in Ireland is employed in carrying out important work in connection with military operations. Their value in dealing with ambushes is fully realised by the Commander-in-Chief, and when it is considered advisable to employ them in this way they are so utilised. The military authorities have full control over the use of aeroplanes.

* * *

### AIR FORCE DETACHMENTS ABROAD.

On Feb. 24th the following written answer was given:—

In reply to questions by Mr. GALBRAITH, Major ENTWHISTLE, and Mr. KILEY, Mr. CHURCHILL gave the following particulars as to the monthly cost of Royal Air Force detachments abroad:—

| | |
|---|---|
| Constantinople, | £3,000. |
| Mesopotamia, | £73,000 |
| Palestine, | £23,000. |
| Ireland, | £33,000. |

# THE ROYAL AERONAUTICAL SOCIETY.

## WEEKLY NOTICES.

### Lectures.

Air Commodore E. M. Maitland, C.M.G., D.S.O., A.F.C., will preside at the next meeting, which will commence at 5 p.m. on Thursday, March 3rd, in the theatre of the Royal Society of Arts, John Street, Adelphi, W.C. Two papers will be read, on "Parachutes," by Major Orde-Lees, O.B.E., A.F.C., and on "Airship Fabrics," by Mr. J. W. W. Dyer.

The last meeting of the present Session will take place on Thursday, March 17th, when Capt. D. Nicholson, M.I.N.A., Associate Fellow, will read a paper on "Flying Boat Construction."

### NOTICES TO MEMBERS.

Notices of the Annual General Meeting, which is to be held at 5 p.m. on Thursday, March 31st, are now being posted to all voting Members, and should be in their hands by Monday, the 28th, at the latest. Besides the notice a copy of the present Rules, together with the Council's proposed amendments, and a card of membership are enclosed in each envelope. The Council's proposed regulations for the examination of candidates for Associate Fellowship will be sent with the Council Election Ballot papers on or before March 21st. The Council's Annual Report and Accounts will be found in the March issue of the Journal.

### Manchester Association of Engineers.

At the request of the Manchester Association of Engineers, it has been arranged for the Chairman (Air Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C.) to read a paper on "Some Problems in the Design and Operation of Aircraft" before the Members of that body at 7.0 p.m. on Wednesday evening, March 2nd.

### Donations.

The Council desire to acknowledge with grateful thanks the gift of a set of lantern slides from Messrs. Vickers Ltd., which will be added to the loan collection of the Society.

Royal Aeronautical Society, W. Lockwood Marsh,
7, Albemarle Street, W.1, Feb. 26th, 1921. Secretary.

### Wilbur Wright Lecture.

The Annual Wilbur Wright Lecture will be delivered by Major G. I. Taylor. The title of the paper and date, which will be towards the end of April, will be announced later.

The Council desire gratefully to acknowledge the gift of lantern slides for the Society's loan collection from the Westland Aircraft Works.

### Committees.

The usual monthly meetings of the Council and Committees will take place as follows: Tuesday afternoon, March 15th—Lectures and Publications Committee, 4.0 p.m.; Candidates Qualifications Committee, 4.30 p.m.; Council 5.0 p.m.

### Journal.

The March issue of the Journal, which is now published and available to non-members at 2s. 6d. per copy, contains the following papers: "Possible Developments in Aircraft Engines," by Mr. H. R. Ricardo, and "The Instalment of an Aeroplane Engine," by Mr. A. J. Rowledge. In addition the final instalment of the important paper, commenced in the February issue, on "The Development of German Aircraft," appears.

W. Lockwood Marsh,
7, Albemarle Street, W.1, March 4th, 1921. Secretary.

# THE ROYAL AERO CLUB.

## ANNUAL GENERAL MEETING

The Annual General Meeting of the Members of the Royal Aero Club of the United Kingdom will be held on Wednesday, March 30th, 1921, at 3, Clifford Street, New Bond Street, London, W.1, at 6 p.m.

Notices of Motion for the Annual General Meeting must be received by the Secretary not less than twenty-one days before the Meeting, and must be signed by at least five Members.

Committee.—In accordance with the Rules, the Committee shall consist of 18 Members. Members are elected to serve for two years, half the Committee retiring annually.

Retiring Members are eligible for re-election.

The retiring Members of the Committee are Lieut.-Col. John D. Dunville, Lieut.-Col. Spenser D. A. Grey, D.S.O., Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Squadron-Leader T O'B. Hubbard, M.C., R.A.F., Lieut.-Col. F. K. McClean, Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F., The Viscount Northcliffe, Lieut.Col. Alec Ogilvie, F. Handley Page.

Squadron-Leader T. O'B. Hubbard, M.C., R.A.F., and Lieut.-Col. Spenser D. A. Grey, D.S.O., will be going abroad shortly, and do not offer themselves for re-election.

Any two Members of the Club can nominate a Member to serve on the Committee, provided the consent of the Member has been previously obtained. The name of the Member thus nominated, with the name of his proposer and seconder, must be sent in writing to the Secretary not less than fourteen days before the Annual General Meeting.

## INTERNATIONAL SEAPLANE RACE.

The Royal Aero Club has decided to contribute £1,000 towards the expenses of the British representatives competing in the International Seaplane Competition for the Jacques Schneider Trophy, to be held in Venice in September.

Italy is the present holder, and each country is entitled to challenge with three competitors. The Royal Aero Club will select the three competitors to represent Great Britain, and all enquiries should be addressed to the Secretary.

## GORDON BENNETT INTERNATIONAL BALLOON RACE, 1921.

The International Gordon Bennett Balloon Race will be held this year at Brussels in September next.

The British competitors will be selected by the Royal Aero Club, and anyone wishing to compete should communicate at once with the Secretary.

# PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of The Aeroplane. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]

### Engagements.

ANDERSON-HOOD.—The marriage arranged between Major H. Graeme Anderson, M.B.E., M.D., F.R.C.S., Surgical Consultant to the Royal Air Force, of 75, Harley Street, W., and Gladys, elder daughter of Charles Hood, of Hatch End, Middlesex, will take place on March 18th at St. Columba's (Church of Scotland), Pont Street, S.W., at noon.

BRADBURY—CHALLEN.—The engagement is announced between Flying Officer John Bradbury, R.A.F., son of Mr. J. Bradbury, of New Barnet, and Helen, daughter of Mr. and Mrs. L. B Challen, of Southampton, and Isle of Wight.

EDELSTEN—SMITH.—The marriage arranged between Flying Officer Joscelyn Edelsten, R.A.F., Amaza, Egypt, and Miss Lilyan Grace Smith, The Oaks, Burton-on-Trent, will take place in Cairo at the end of March.

MEEK—PEARCE.—An engagement is announced between Flying Officer Kenneth Alexander Meek, M.B.E., Royal Air Force, only son of Mr. and Mrs. Herbert Meek, of Hull, and grandson of the late Alexander Meek, of Goole, and Mary Victoria Bird, second daughter of C. W. Pearce, Mus. D. Cantab, and Mrs. Pearce, of 18, The Vale, N.W.2.

### Marriages.

POTTER—THOMAS.—On March 3rd, at St. Mark's Surbiton, by the Rev. R. M. Curwen, Vicar of Camberley, assisted by the Rev. F. M. Jackson, curate of St. Mary Abbot's, Kensington, John Randall Potter (late Major, R.A.F.), elder son of Canon and Mrs J. Hasloch Potter, of Surbiton, to Jessica Wilson Thomas, widow of Owen R. Thomas, only daughter of Mr. and Mrs. Wilson Cruttwell, also of Surbiton.

SHALES—WARNER.—On Feb. 17th, at the Marylebone Parish Church, by the Rev. F. Russell Salusbury, Rector of Weeford, uncle of the bride, assisted by the Rev. R. Percy Thompson, Francis Harbroe Shales, R.A.F., to Sylvia Violet, daughter of Mr. and Mrs. J. C. Warner, St. Mary's, Winchester.

STYRAN-MITFORD.—On Feb. 15th, at Mitford Parish Church, by the Rev. Edward Mitford, Rector of Acrise, Kent, uncle of the bride, assisted by the Rev. Canon MacLeod, Vicar of the Parish, Lt. Arthur Jack Graham Styran, M.C., A.F.C., R.A., and R.A.F., son of the late Capt. J. H. Styran, R.A., to Violet Edith Mitford, youngest daughter of Robert Osbaldeston-Mitford, of Mitford Castle, Esq., Northumberland.

### Births.

BIRKETT.—On Feb. 24th, at Brooklyn, Sauston, Cambs., the wife of Lieut. G. Birkett, R.A.F.—of a daughter.

GOODCHILD.—On Jan. 14th, at Clapham, the wife of Serjt.-Major C. Goodchild, R.A.F., Halton Camp, of a daughter.

MACK.—On Feb. 27th, at 7, Elgin Court, Maida Vale, Eva Margaret (nee Money), the wife of Flt.-Lieut. R. G. Mack, R.A.F.—of a son.

WEBB—BOWEN.—On Feb. 19th, at a nursing home, to Violet (nee Hadley), wife of Air-Commodore T. I. Webb-Bowen, A.O.C., India—a son.

WELLS.—On Feb. 19th, at 1, The Bungalow, Vine Lane, Hillingdon, Uxbridge, the wife of Group Captain Hardy V Wells, Royal Air Force Medical Service—a daughter.

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## INDEX TO ADVERTISERS

| | |
|---|---|
| Accles & Pollock, Ltd. | *Front Cover & Back Cover* |
| Armstrong Siddeley Motors, Ltd. | 235 |
| Arrol-Johnston, Ltd. | *Front Cover* |
| Auster, Ltd. | *Front Cover* |
| Beardmore Aero Engines, Ltd., The | *Front Cover* |
| Bowden Brake Co., Ltd., The | 244 |
| Bristol Aeroplane Co., Ltd. | 237 |
| British Thomson-Houston Co., Ltd., The | 228 |
| Burlington Publishing Co., Ltd., The | 242 |
| Calthrop, E. R., Aerial Pat., Ltd. | 237 |
| Cellon, Ltd. | 243 |
| Cunard Line | 244 |
| Davis Furnace Co., The | 237 |
| De Havilland Aircraft Co., Ltd., The | 228 |
| Fairey Aviation Co., Ltd., The | 223 |
| Handley Page, Ltd. | 233 |
| Kodak, Ltd. | 233 |
| McGregor, Gow, & Holland, Ltd. | 237 |
| Metal Airscrew Co., Ltd. | *Front Cover* |
| Napier, D., & Son, Ltd. | 225 |
| New Pegamoid, Ltd. | 244 |
| Nieuport and General Aircraft Co., Ltd. | 235 |
| Roe, A. V., & Co., Ltd. | *Inside Front Cover* |
| Short Bros., Ltd. | *Back Cover* |
| Titanine, Ltd. | *Front Cover & Inside Back Cover* |
| Westland Aircraft Works | 231 |

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# THE AEROPLANE

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## ON CANADIAN ACTIVITIES.

Of course, each and every one of the British Dominions flatters itself that it leads all the others intellectually, morally and physically. As an example thereof one's Australian friends will perhaps forgive one for telling a story against an Australian of a certain type which is just as much disliked by he best Australians as it is by everybody else.

This particular Australian had been holding forth in a drawing-room on the manifold virtues and abilities of the Australian people. He impressed on everybody how they were physically, morally, intellectually, and in every other way superior to everybody else on earth. Finally, when the Australian had run himself dry, a singularly offensive Englishman remarked: "Well, damn it, you ought to be the finest people on earth. Your ancestors were sent to Australia by the best judges!"

After that it took six strong men to hold the Australian and to prevent him from demonstrating at any rate his physical, if not his intellectual, superiority over the Englishman.

This attitude of superiority is, after all, a very healthy thing and it is, above all things, essentially English. There is nothing which makes an Englishman so offensive to the foreigner of every nation as his calm assumption of superiority. Being oneself British though, thank Heaven, not English one can at any rate sympathise with this attitude of mind and one does firmly believe that, with all his faults, the individual citizen of the British Empire, taking him all round, is superior to anybody else in the world. But in most cases one would hesitate to say which particular section of the British Empire is in advance of any other section.

### A Clear Superiority.

So far as aviation is concerned, however, one has very little hesitation in making a perfectly definite statement that the Dominion of Canada is far ahead of any other of the British Dominions Overseas. It is not so much that there is very much more flying being done in Canada than in other parts of the British Empire, though it is possibly true that there is more flying done there; but the outstanding fact is that Canada is organising for the development of aviation in a manner which other British Dominions and even the Mother Country herself has not even begun to consider possible.

Canada is blessed with an Air Board composed, as the evidence clearly shows, not merely of enthusiastic aviators but of ound level-headed men of the kind which the average English business-man imagines himself to be and most emphatically s not. Also the Canadian Air Board includes men with experience of regular Civil Service methods, such as are not too requently followed even in the British Air Ministry. Also t includes men with Naval experience, Regular Army experience, and scientific experience. And apparently almost verybody on the Board is blessed with the great saving grace, a sense of humour. The result is that an immense mount of work has been done in a very short time and plans for really practical development are being laid down n such a way that they can actually be carried out.

### An Aid to Commerce.

Instead of holding aloof from ordinary commercial venturers ther than people in the Aircraft Industry the Canadian Air Board has gone out of its way to impress on all sorts of commercial people in Canada the benefits of aviation. An example f this was seen in THE AEROPLANE some few months ago when n article by Mr. Ellwood Wilson, Chief Forester of the aurentide Company, was published, showing how much success has been achieved by his firm through following the ood advice given in the first place by the Canadian Air Board.

In the same line of business still further progress is now being made. For example, one hears that not long ago a convention of the Woodlands Section of the Canadian Pulp and aper Manufacturers' Association was held in Toronto. This meeting was attended by a very prominent member of the anadian Air Board.

One does not recall that any meetings of trade associations r federations have been attended by any representative of the ritish Air Ministry in a similar way.

It is of interest to note that this Association, which is a very rich and powerful one, is strongly in favour of air work for forestry and that practically every company composing the Association is willing to spend money on aircraft for forest work and internal communication. How this money is to be spent will, one imagines, depend very largely on the enterprise of the people who make aeroplanes in England and in the United States.

### A Chance for British Enterprise.

Naturally, the timber people in Canada would like the Air Board to undertake all their forest patrol work for them. The Canadian Air Board is very much too sound to do anything of the kind. The Air Board's policy is to confine its efforts to Government work, both Dominion and Provincial, thus leaving the commercial field clear for business firms to do the work and make a profit out of it.

It seems that if a British firm had sufficient capital and at the same time had the enterprise and intelligence to send suitable machines to Canada and undertake the forest patrol work of a number of timber firms on a contract basis very good business could be done.

Failing this one ventures to suggest that an enterprising British firm might with advantage send a competent representative to Canada and make a working alliance with one or other of the various Canadian firms who manufacture canoes and launches for use on the great Canadian waterways. Such firms are eminently suited to aeroplane work, especially to the production of flying-boats and seaplanes, and such an alliance would naturally have even a better chance of getting Canadian business than would a purely British firm endeavouring to sell British-built goods in Canada.

If British firms do not display the enterprise necessary to capture the Canadian market, then it simply means that the Canadian timber firms will buy American machines, just as the Canadians in general buy American automobiles when, if the British motor-mongers had had any intelligence, Canada would have been full of British cars.

### Special Requirements.

Howbeit, let us leave British manufacturers to consider this question and let us revert to Canada's own activities.

Another very enterprising action on the part of the Canadian Air Board was the issue last September of specifications for aeroplanes designed specially to the needs of Canada. These specifications were drawn up by Canadians who know as much about flying as does anybody in this country.

It has been said by British designers that the Canadian Air Board's technical experts expected rather too much. Canada's reply to that is very simply that the more you ask for the more you get, and that the specification was deliberately intended to produce a type of aeroplane superior to anything existing at the moment, and particularly suited to Canadian conditions.

One gathers that even though the specifications were not actually fulfilled by those who tendered for the orders, quite a number of very promising ideas were produced. Unfortunately many of these ideas were quite undeveloped, and it would take longer to develop them than the Air Board cares to wait for the machines. Consequently it is said that the Air Board has ordered a number of machines which, even as they exist to-day, are considered to be more or less suitable for the particular requirements of the Canadian Continent. Though one is not absolutely certain of the quantities that have been ordered, one gathers that the makes include the Vickers amphibian, the Supermarine amphibian, the Fairey and the Westland.

Possibly other firms may not agree with the choices made in this case, but anybody who has an all-round knowledge of aviation must admit that while other machines may be the equal of some of those ordered, it would be difficult to find anything superior. And certainly the choice shows that practical knowledge and real intelligence has been exercised in making the selection.

### A Projected Air Line.

As indicating the general interest which is now being taken in Canada by the business community it is particularly worthy of note that the Canada Steamship Lines propose to run a flying-boat service between New York, Montreal, and Toronto this summer. It is said in Canada that they have bought two Vickers machines, probably amphibians, for this service.

Presumably the idea is to fly up the Hudson River, jump the divide near the Canadian frontier, and use the Canadian waterways if necessary for the rest of the journey. Both in the United States and in Canada along this route there are either rivers or lakes which would easily accommodate a machine of the class of the "Viking."

It is immensely satisfactory to see a firm of this class seriously undertaking such a proposition. Such a firm has the commercial organisation and experience to handle business properly and to gather in tourist traffic. Also, it has the money to do the job as it should be done and to pay really good people to look after it.

The trouble hitherto in Canada, as well as in the United States and elsewhere, has been that so many of the early aeroplane ventures have been simply of the nature of "joy-ride" concerns where young pilots, doubtless excellent as such but without business experience, have been more or less playing around with small machines, such as the "J.N." Curtisses and standard Avros, near the cities, whereas in Canada particularly the proper line of development for aviation is for well-financed business firms to develop regular air lines along the waterways between cities and to use flying-boats or powerfully engined seaplanes capable of carrying four passengers and a pilot at least.

### An Adventurous Idea.

Another promising venture in Canada is being instituted by the Imperial Oil Company, which is the Canadian branch of the Standard Oil Company. This company has recently opened up a new oilfield at Fort Norman on the MacKenzie River opposite Great Bear Lake. Communication in this section of Canada is exceptionally bad and obviously the right way of carrying mails and passengers is by air. The passengers in such a case would be, naturally, the officials of the firm, whose duties would require them to be frequently on the move between the oilfield and headquarters. The actual working population of the oilfield would be more or less stationary.

This venture is apparently the origin of the wild yarn which appeared in the daily papers late last year alleging that crowds of aeroplanes were being got ready in Canada for the rush to the new oilfields on the Mackenzie River. The "rush" is apparently merely a plan to establish a sound means of communication with an oilfield which is already the property of the Oil Trust. There will be no oportunity, presumably, for "prospectors" by aeroplane to "stake claims."

Doubtless by the time the oilfield is developed to the stage of producing in quantities it will be possible to lay railways or pipelines to the more populous areas; but in the meantime rapid communication is necessary and aeroplanes appear to be the obvious solution of the communication question.

### A Bad Choice.

It is said that the firm has bought two Junkers all-metal monoplanes in the United States for this job. It hardly seems that these are the most suitable machines for the purpose, seeing that they take a long run to get off and need a great deal of space in which to land, and are therefore particularly unsuited to areas in which there are neither aerodromes nor large cultivated fields.

However, such a firm as the Imperial Oil Company can afford to make mistakes of this kind and will doubtless realise, at the expense of crashing their two German machines, that they would do better to buy British aeroplanes or hydro-aeroplanes which are more suited to their work.

Apparently the Canadian Air Board is displaying its usual intelligence in this matter, for one is told that though the machines have been passed as airworthy for ordinary work, which of course they are, the Air Board has refused to license them for use in the MacKenzie Basin until it is convinced that the company's ground organisation is such as to permit of machines of this class being used with reasonable safety. It would certainly not be a good thing for Canadian aviation if unsuitable machines were flown into the MacKenzie area and merely disappeared from human ken.

### The Canadian Air Force at Work.

It has already been recorded in this paper that the Canadian Air Force is being organised on a proper military basis. It is not intended to maintain a large standing Air Force and the sensible plan has been adopted of organising the force as a species of aerial militia.

This scheme is already in operation and pilots and mechanics are now coming for their periods of training, or "refresher courses" as they might be called. This scheme for keeping both pilots and mechanics in practice is bound to have a good effect on civil aviation in that it will maintain the enthusiasm of the officers and men and will give them an opportunity of demonstrating to the civilian population that flying is not a business which is to cease with the cessation of war.

Also, given that the training stations are properly conducted on modern principles, it will demonstrate that many thousands of miles can be flown without accident in time of peace. This will remove the bad impression which was probably created during the war when pilots were being pushed through their training at high pressure with a consequently large proportion of accidents.

It is said that one reason why both pilots and mechanics are coming in for training so readily is that no civilian firm has tackled winter flying to any considerable extent and consequently the personnel of such firms as exist in Canada are glad of having the opportunity of drawing Government pay and living in Government quarters during the off-season for "joy-riding." Also, the personnel seem to appreciate the fact that at the Government training station they will have the opportunity of flying more up-to-date machines than they can afford for themselves and of making the acquaintance of new types of engines and general equipment. The Air Board has taken the very sensible course of extending the period of training for mechanics when the mechanic shows keenness and ability. These courses for picked men are now extended to three months instead of the 28 days which was the original period.

### The Air Board's Methods.

As has already been said, the Canadian Air Board itself is composed of men who are thoroughly enthusiastic about the future of aviation and is leavened by the presence of older men with experience of the running of Government services and departments. The excellence of the combination is evident to anybody who has the privilege of seeing the various communiqués and reports issued by the Canadian Air Board. Unfortunately, lack of space in these times of hardship for the Aircraft Industry makes it impossible to reproduce many of these documents, as one would like to do if more space were available. Nevertheless, one has said enough to indicate that aviation is very much more alive in the Dominion of Canada than anywhere else in the world, except perhaps where certain regular air routes are still in operation in France and in Germany and between England and the Continent.

Moreover, this keenness for aviation is by no means confined to the members of the Air Board itself. One has good reason to believe that such other officials as those of the Surveyor-General's Department, of the Forestry Department, the Department of Mines, the Department of Marine and Fisheries, the Agricultural Department, and the Department of the Royal Canadian Mounted Police are all fully alive to the benefits which aviation can confer on their respective work in a country of great spaces such as Canada. Therefore not only is the work in progress at the moment of a highly satisfactory nature but the prospects for the near future are immensely encouraging, always provided of course that the Canadian Government can be induced to spend on the development of aviation the sums which the Air Board desires.

There seems every prospect of at any rate a reasonable amount being approved year by year by the Government, and therefore one is justified not only in complimenting all concerned with the Canadian Air Board on the excellent work which they have done and intend to do, but one is justified in believing that the prospects for aviation in Canada are brighter than those in almost any other part of the Globe.—C. G. G.

## THE AIR ESTIMATES, 1921-22.—III.

Major-General Seely, after saying how badly things were going, continued in his usual vein to condemn Mr. Churchill for his occupancy of two great offices of State. Referring once again to his own departure from the Air Ministry, which, he said, was often imputed to his supposed desire to usurp the place of Mr. Churchill and to disagreement with the Prime Minister, said that he did not think that "any man, unfortunately, was ever so swiftly justified by events." General Seely is entitled to hold his own views, but we may be permitted to doubt his powers of averting the disaster which has come.

He said no good could come to British aeronautics until a whole-time Minister for the Air was appointed. He advocated increased expenditure on aerial matters, but in no part of his speech did he offer any constructive criticism of value. Political economy has never exercised power over the right

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*Seuls détenteurs du brevet Fairey pour dispositif de cambrure variable pour aéroplanes, hydravions et bateaux volants.*

Unicos poseedores de la patente Fairey de dispositivos de combeo variable para aeroplanos, hidroaviones y barcos aéros.

**Designers and Manufacturers of all classes of Seaplanes, Flying Boats, Aerodromes, Amphibian Aircraft, Aircraft specially fitted for Survey and Photographic purposes, Floating Hangars, and complete equipment for same.**

**Designers by special request of the largest Flying Boat built for the British Government.**

**Contractors for the laying out and complete equipment of Passenger, Mail and Express Goods Services by Aircraft.**

**Designers and Manufacturers of the Fairey Type III. Series of Machines as supplied in quantity to the British Government during the War and since its termination. In this series of Machines the Fuselage, Centre Plane, Tail Unit, etc., are standard and are adapted to take different types of wings chassis and engines of other Machines of the series to suit the particular purpose for which the machine is required. All machines of this type have folding wings and are fitted with our patent Variable Camber Gear giving high performance and lifting power combined with low landing speed.**

*Constructeurs de toutes espèces d'hydravions, bateaux volants, aéroplanes, appareils amphibies, avions spécialement aménagés pour levées topographiques et photographiques, hangars flottant et équipement complet pour ces derniers.*

*Constructeurs, sur commande spéciale du Gouvernement Britannique, du plus grand bateau volante construit jusqu'à ce jour.*

*Etude et entreprise de la fourniture du matériel complet pour services de transport aérien rapide de passages, courrier et marchandises. Constructeurs des Fairey Type III. Série de machines fournies en grandes quantités au Gouvernement Britannique pendant la guerre et depuis la cessation des hostilités. Dans cette série de machines, le fuselage, le plan central et la queue, etc., sont standardises, et sont construits de manière à pouvoir recevoir des ailes des types différents, ainsi que des châssis et moteurs d'autres machines de la série, de manière à être appropriés à l'usage auquel la machine est destinée dans chaque cas particulier. Toutes les machines de cette série ont des ailes démontables et repliables, et sont munies de notre dispositif breveté de cambrure variable, qui permet les plus grandes performances et qui combine une grande puissance de soulèvement avec une faible vitesse d'atterrissage.—*

Diseñadores y constructores de hidroaviones, barcos aéreos, aeroplanos, aparatos anfibios, de todas clases, tambien de apartos especialmente adecuados para el levantamiento de cartas topográficas y fotografias, hangares flotantes y completo equipo para estos mismos.

Diseñadores, á pedido especial del Gobierno Británico del barco aéreo mas grande que se ha construido para este gobierno.

Proveedores de todo lo necesario para servicios de transporte aéreo de pasajeros, correos y mercancías.

Diseñadores y constructores del tipo Fairey III. Serie de aparatos suministrados en cantidad al Gobierno Británico, durante la guerra *y después de su terminación.* En esta serie de aparatos, el fuselage, el plano central y la unidad de la cola, son standard y fabricados para adaptarse á diferentes tipos de alas, chassis y motores de otros aparatos de series que sean adecuadas para ejecutar los fines particulares para los cuales se requiera el empleo del aparato. Todas las máquinas de este tipo, tienen alas plegadizas y eatán provistas del dispositivo patentado de combeo variable Fairey que da una alta performance y potencia de ascensión combinada con una velocidad baja de aterrisaje.

honourable gentleman, and he cannot see that mere expenditure of public money cannot save any industry, from glass-making to aeroplane building.

Colonel Newman followed in debate and desired primarily that "a closer co-operation between the Air Force and civilian air services and aircraft manufacturers is essential." He thought that the money granted under the Air Estimates was not spent to the best advantage. The Estimates were "severely military from the first to the last page," which seems to imply curious ignorance on the part of the honourable and gallant member.

He asked: "Do we want an Air Force in this country of 30,880 whole-timers?" and wanted to know "what on earth all of them were doing." There is a curious infelicity about the last phrase, for the air is the element which should attract his closest attention. His first question is as absurd as would be one demanding the use in peace time of a standing army. He desired that the Air Force should mainly be territorial in form. He thought it essential that aerial services should be helped to exist that they might maintain large numbers of pilots, artisans and aeroplanes ready, in return for present subsidy, for use in time of military need He did not endeavour to explain what earthly (or should it be "heavenly") use civil aircraft would be for offensive action. The personnel of these companies would be enrolled on a Territorial basis under liability to fight when called upon to do so.

In addition a small, highly efficient Air Force would be maintained. He did not appear to realise that the existing force was hardly large enough even for present needs. The remainder of his speech elaborated the same arguments.

Sir W. Joynson-Hicks seconded Colonel Newman's amendment in favour of closer co-operation between the Air Force and civil air services, and congratulated the Secretary of State for Air on his speech. That done he proceeded to criticise, saying that it was the eighth time he had had that privilege in regard to Air Estimates.

### Airships

He thought it extraordinary that our airships were to be scrapped altogether and that the hangars, buildings, and apparatus were to be handed over as a free gift to any company that liked to take them over. He wondered if the Naval authorities had been consulted upon this matter. He expressed anxiety as to what was to be done with the Naval officers who had been employed on airship work

For once in history he associated himself with Major-General Seely in regard to the necessity for a separate Air Minister.

### Egypt.

Referring to Mr. Churchill's departure for Egypt, he was anxious to know whether, in view of the importance of Egypt from an aerial point of view, he proposed to do anything to increase facilities for aerial work in that country.

### The Big-Ship Question.

No honourable Member appeared to be able to keep away from the *Times*, and Sir W. Joynson-Hicks was no exception to the rule. He said that the Cabinet Committee appointed to go into the "Big Ship" question had nobody on it "qualified to consider this question of the big ship and the torpedo." At this point the Secretary of State for Air intervened to say that "the Chief of the Air Staff and the Controller-General of Aviation gave the Committee full advice in regard to that matter in a long discussion."

### Torpedo-carrying Aircraft.

Sir W. Joynson-Hicks, continuing, wondered whether the House realised how much more effective our Service would be if we had an efficient torpedo-carrying aeroplane at the present time. He had apparently read The Aeroplane recently, for he said: "It is possible to have to-day torpedo-carrying aeroplanes flying at a height of over 10,000 feet, shutting off their engine so as to make no noise, and then gliding down at a speed of 140 miles per hour. They can carry a torpedo weighing 1,500 lb., with 1,000 lb. of T.N.T All these details have been published in a technical paper, so I am not giving any information away to possible enemies."

He thought that no battleship could possibly cope with torpedo aircraft. In ten years to come we should have aeroplanes carrying torpedoes weighing 3,000 lb. At the battle of Jutland there were about 100 destroyers, each costing £150,000. A torpedo-carrying aeroplane only cost from £5,000 to £7,000. Therefore, for the sake of the same cost we could have had several thousand torpedo-carrying aeroplanes in place of the hundred destroyers. Under such conditions, in his view, the German fleet would have been entirely destroyed at Jutland. One thinks that Sir W. Joynson-Hicks' figures are a little erratic, and in any case it is of future battles that such dreams should deal and not in regard to a battle that was fought under the only conditions know at that period of history.

He thought that every pre-Armistice machine was now obsolete. What was being done in America? There was a new armoured three-seater triplane carrying two 12-cylinder engines, eight machine-guns, and one cannon. Ten of these have been ordered for experimental purposes by the American Government. He implied that insufficient orders were being given in this country to obtain such results.

### Civil Aviation.

Referring to civil aviation, he asked why large sums of money should be spent on building hangars, buying petrol, and establishing meteorological stations unless it was intended to make civil aviation a possibility. Foreign countries were rapidly getting a monopoly of aerial transport, and on that much more money should be spent to assist British companies.

Mr. Churchill in his view was a little too frightened of the *Times*, and he thought that the right honourable gentleman should have asked for a larger allocation of money for civil aviation. Opposed to subsidies as he was himself, he had now come to the conclusion that subsidies were essential during the next year or two if there was to be any improvement in British aerial transport.

### The Jutland Fallacy.

Rear-Admiral Adair in the course of a short speech said that he thought that sooner or later the Naval side of the Royal Air Force would return to the Navy. He was a great believer in airships and thought they had a special value for convoy purposes. In regard to Sir W. Joynson-Hicks' remarks on Jutland and the use of aircraft in a naval battle, he referred to "the possibility of some thousands of aeroplanes dealing with the German battleships in the battle of Jutland, instead of a few destroyers. Those craft have got to start from somewhere, and, if they are carried in ships, how many ships would it take to carry them, and are not all of those ships susceptible to attack, with the destruction of everything in them, just as much as any other vessels? Furthermore, it must be remembered that in the future we shall not be dealing with short distances, such as that from here to Jutland. We shall be in the Pacific, with distances of thousands instead of hundreds of miles."

Lieut.-Colonel Burgoyne was anxious to know what progress had been made in regard to the replacement of Naval and Military garrisons by aircraft.

### An Academy Picture.

He, too, followed the general custom of attacking Mr. Churchill's duality of appointment. In the next Academy he thought "we shall see a picture of him (Mr. Churchill) with a wideawake Colonial hat, smoking a corn-cob pipe, and leaning against an aeroplane, entitled 'Portrait of an Officer, by Himself.'"

The first half of Mr. Oswald Mosley's speech was a lament about Mr. Churchill holding two appointments at once.

### The French Expenditure.

In regard to civil aviation he said France was devoting £7,000,000 in nominal value to civil aviation, or £3,400,000 at the present rate of exchange. In this country the whole amount devoted to civil aviation was under £1,000,000.

He thought that in view of the rapidity of change in aircraft types very much more than £1,835,000 should have been set aside for research.

### An Egypt-Karachi Service.

Mr. Bartley Denniss wanted Mr. Churchill to begin a system of Empire air routes, with one from Egypt to Karachi, and said that he believed that such a route would shorten the voyage from Australia to this country by a month. Here Mr. Churchill interjected the remark, "Ten days." Mr. Denniss, continuing, said that passengers would go from Australia to Ceylon, take the railway from Ceylon to Karachi, fly to Egypt, and then come by boat and train in the usual way. He thought Mr. Churchill might well introduce a Supplementary Estimate in order to make this experimental route possible.

Sir Donald Maclean devoted his entire speech to an attack on Mr. Churchill's duality and on the announcement that the Patronage Secretary for the Treasury was to deal with the Estimates when they went into Committee. He thought Mr. Churchill had no right to disappear to Egypt and leave Estimates for nearly £20,000,000 in the charge of a statesman who was not even connected with the Air Ministry

### Economy

Mr. Esmond Harmsworth, true to the dictates of his conscience and the Harmsworth Press, opposed the increase of £2,000,000 for the Royal Air Force, if there was to be no corresponding decrease in the expenditure on the Army and Navy.

Lieut.-Commander Kenworthy, in a vein of good sense and bad taste, thought much more money should be spent on the Royal Air Force.

### The Straits Settlements.

In addition to stations already contemplated in Malta, Egypt and India he considered it vitally important that stations should be founded in the Straits Settlements. Strategically that part of the world was vastly important

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*Aircraft Engineering July, 1920.*

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He was sorry that Admiral Adair talked of the Naval wing returning to the Admiralty.

"If the Air Service gets once more under the deadening hand of the Admiralty, Heaven help them, the Admiralty will strangle development, and to take this step would be to take the most retrograde step possible." On the other hand he thought that the Air Ministry should control its own aircraft-carriers in exactly the same way as the Army controls its own transport. In regard to the necessary Naval ratings there would be no more difficulty in carrying Naval gunners in Air Force ships than there is at present in carrying Air Force officers in battleships and cruisers.

He was sorry that so little was to be spent on civil aviation, for "flying is going to bring about better relations between peoples by obliterating frontiers." Civil aviation, therefore, should be developed to the utmost.

### MR. CHURCHILL'S REPLY

Mr. Churchill in his reply said that as it had been pointed out the tenor of nearly all the speeches had been a reproach of the Government for not spending more money on the Air. He had no complaint to make of that.

He objected to Sir Donald Maclean's speech, saying that it was unfair and grossly extravagant Sir Donald Maclean objected to Mr. Churchill's departure for Egypt on the day after the Debate on the Air Estimates, but the facts were as follows :—

He, Mr. Churchill, had been asked to take over responsibility in the Middle East, and those responsibilities were in the forthcoming year to cost not far short of £30,000,000. He desired to make a great curtailment of this charge, and he could not do that unless he was the man on the spot and obtained that agreement. He had not known at that time that he would be responsible for the Air Ministry during the Estimates. Nothing was further from his mind than to offer an affront to the House.

### WORKING HOURS.

In reference to Colonel Seely's statement that he, Mr. Churchill, had only given one hour per week to the Air Ministry, he said that it was absolutely untrue. He was in fact less than an hour per week inside the Air Ministry, but there was a reason :

"My right hon. friend objected violently to my even setting foot inside the Air Ministry. Although I could not help, by virtue of my office, being the President of the Air Council, my right hon. friend objected and protested personally and formally to me whenever I appeared at the Air Ministry, and it was my right hon. friend's conduct which made it very difficult for me, who was a long and intimate personal friend of his, continually to present myself there when I knew it caused him pain and when I knew that in him I had a highly competent and skilled subordinate, a man of very great experience in public affairs, who had held the highest offices of the State with unquestionable distinction; and when, to meet his wishes and not to hurt his feelings, I did not obtrude on what he considered his own peculiar domain, I think it is an unfair point for him to come down here and say, 'You never came more than a hour a week into the office.' "

At this point Major-General Seely endeavoured to withdraw his original remark.

After the further assurance of Mr. Churchill that he offered no disrespect to the House, the question was put "that Mr Speaker do now leave the Chair."

The House then divided, Ayes 177, Noes 50.

The House then went into Committee.

## THE NAVY ESTIMATES.

The following extract is taken from the Memorandum which prefaces the Navy Estimates for 1921-22 :—

### NAVAL AIR DEVELOPMENT.

During the year the Naval Staff has been in close co-operation with the Air Staff both in matters of development and the tactical use of aircraft for Naval purposes. The information gained from exercises and experiments has been fully interchanged, and specifications for improved designs of aircraft have been laid down. It is hoped that during this financial year the air equipment of our fleets with heavier-than-air craft will make a big stride.

With regard to the suspension of the provision of airships for the Navy, the Memorandum says :—"The Air Ministry informed the Admiralty that the economies imposed upon them in the preparation of the Air Estimates would compel them to reduce considerably the provision of heavier-than-air craft unless the Airship Service was suspended. The Admiralty considered that any such reduction in the vital Naval requirements in heavier-than-air craft, which are essential to Naval efficiency, and to which Naval Votes are heavily committed in the provision of aircraft carriers, could not be accepted. While the Admiralty regret the decision of the Air Ministry to suspend the Airship Service, they realise that in view of the stringent financial restrictions no other decision could have been arrived at. The limited funds now available to meet Naval Air requirements will, therefore, be expended on heavier-than-air craft instead of on airships. In view of the importance of training R.A.F. personnel in Naval work, arrangements have been made to put an aircraft carrier at the disposal of the Air Ministry for certain periods for this purpose."

## THE SUBSIDIES COMMITTEE.

On Thursday, March 10th. representatives of the leading aircraft constructors and quondam air line operators met the Subsidies Committee at the Air Ministry for discussion. Many people spoke, and there was an amusing interchange of views between the one-time moving spirits of the two least unsuccessful lines, Messrs Holt Thomas and Handley Page.

One gathers that there were few if any points on which anyone present could agree with one another, but at any rate it was quite obvious that the Government are determined to take immediate action to try and restart British air travel on a sound basis.

In addition to the members of the Committee (the Marquis of Londonderry, Sir F. H. Sykes, and Sir James Stephenson) the following were also present :—Brig.-General F. H. Williamson (G.P.O.); Mr. H. White Smith (Bristol Aeroplane Co.), Commander Bird (Supermarine Aviation Co.), Mr. Parker (Messrs Shorts Ltd.), and Mr. C. V Allen, representing the Society of British Aircraft Constructors, Ltd.; Captain de Havilland and Colonel Marsh representing the Royal Aeronautical Society; Mr. Handley Page and Mr. Cogni (Messrs. Handley Page, Ltd.); Major-General Sir W. S. Brancker; Mr. G. H. Thomas; Colonel F. Searle (Air Transport and Travel, Ltd.); Brig.-General Caddell and Captain Acland (Messrs. Vickers Ltd.); Captain de Valda (Adastral Air Lines, Ltd.); Mr. G. H. M. Kennedy (Air Post of Banks, Ltd.); Major Patrick (Bermuda and West Atlantic Aviation Co., Ltd.); Mr. Rhodes (Blackburn Aeroplane Co.); Mr. Haydn White (Commercial Wing Syndicate); Messrs. Instone (Instone Air Line); Captain Ward (William Beardmore and Co.); Mr. Lord (A. V. Roe and Co.); Mr. Fulton (Messrs. Martinsyde, Ltd.); Lieut.-Colonel W. A. Bristow (Messrs. Ogilvie and Partners); Captain D. M. Greig (Air Express, Ltd.); Mr. Lovibond (Lep Aerial Travel Bureau); representatives of the Westland Aircraft Works (Messrs. Petters); Mr. A. E Baxendale, Colonel Basil Foster, Mr. Elder-Hearn, Mr Harold Hurlin and Mr. Ingram.—G. D.

## THE CHILEAN AIR SERVICE.

Lt.-Col. J. L. Travers, O.B.E., who was lately working in the Department of Civil Aviation at the Air Ministry, has now relinquished his position in the Air Ministry in order to take up a position of importance in the Chilean Naval Air Service.

Lt.-Col. Travers' connection with aviation dates back to nearly prehistoric times. On May 16th, 1911, he took his pilot's certificate (No. 86 of the Royal Aero Club) at Hendon. In the original seniority list of the Royal Naval Air Service (July 1st, 1914) he appears as 10th on the list of Flight Commanders with the suffix E, denoting that he was appointed for engineering duties.

During the war Col. Travers served in K section, the Air Department, Admiralty, as a Squadron Commander under Wing Commander J. Seddon, and was largely responsible for the experimental development of new types of seaplanes.

During 1916 Squadron Commander Travers was appointed to the command of the Testing Squadron at the Isle of Grain, a position which he held till some time in 1918. During this period the art of testing seaplanes advanced from the collecting of approximate data to a highly specialised science. During this period he received promotion to Wing Commander, becoming Lieut.-Col., R.A.F., on the formation of that force. From Grain Col. Travers was posted to the Technical Department, Air Ministry, where he remained till demobilised, during the latter part of 1919.

Shortly after demobilisation he received an appointment in the Department of Information, the Air Ministry, where he was responsible for the editing and issue to the public of technical information.

## WHAT THE REPORTER SAW.

From the *Evening Standard*, March 14th :—

"Aircraft on the Thames. Further Alighting Tests with Three Machines To-day.—Further alighting tests of aircraft are taking place on the Thames this afternoon in the stretch of water between Westminster and Albert Bridges. The tests are being organised by the Air Ministry and the Air Ministry's Amphibian, the Vickers' Viking and the Napier Lion will be used."

The Air Ministry really ought to arrange to hold these affairs at some period more remote from lunch-time.

# NAVAL AND MILITARY AERONAUTICS.

## GREAT BRITAIN.

### Education in the Royal Air Force.

It was announced by the Air Ministry on March 8th that Colonel I. Curtis, M.A. (Cantab), had been appointed to be Educational Adviser to the Royal Air Force, and Captain B. H. Sisson, B.A. (Cantab), to be Assistant Educational Adviser to the Royal Air Force.

The former officer, who is the first to hold the new appointment, is an Associate Member of the Institute of Mechanical Engineers. Early in his career he served on the staff of the City Guilds Central Technical College, South Kensington, and in the Royal Naval Engineering College. After a time of service as Naval Instructor in the China and Mediterranean stations he went to the Admiralty in 1903 as General Assistant to the Director of Naval Education. From 1909 until the formation of the Royal Air Force in 1918 he was Deputy Inspector of Naval Schools. He was then lent to the Royal Air Force and late in 1918 was appointed Deputy Director of Education in the Air Ministry.

Captain Sisson, who was Ash Exhibitioner of Emmanuel College, Cambridge, has been Mathematical and Science Master at Haileybury, and has held several other educational appointments. From 1915 to 1917 he served in the R.F.C., and from 1917 to 1918 in the Royal Naval Air Service. During the latter period he was Balloon Officer to the first battle-cruiser squadron, and while serving in H.M.S. *Lion* was mentioned in despatches. For the past year he has been at the Air Ministry as a Staff Officer on Educational Duties.

### No. 209 Squadron Reunion.

The first annual reunion dinner of 209 Squadron, R.A.F. (formerly 9 Squadron, R.N.A.S.) was held at the Dean Hotel on March 5th last. Flt.-Lt. T. F. N. Gerrard, D.S.C., was in the chair. The evening was a great success, and it was decided to hold the dinner annually on the first Saturday in March each year. Particulars may be obtained from Mr. A. H. Middlemiss, 74, Devonshire Road, Hackney, E.9.

## AUSTRALIA.

### The Late Capt. W. J. Stutt.

According to *Sea, Land and Air*, of Sydney, Australia, it is now regarded as no longer possible to hold out any hope regarding the fate of Capt. W. J. Stutt and Serjt. A. G. Dalzell, M.S.M., who in November left the Central Flying School Aerodrome at Point Cook on a D.H.9a, and started off across the Bass Straits in search of a missing steamer, the *Amelia J.* In spite of an intensive search carried out by the naval and military authorities, no trace has been found, and therefore it can only be assumed that they descended in the open sea and sank.

It has been said of Capt. Stutt that during his entire flying career, he had never had a crash of any kind or damaged any machine in which he was flying.

It would probably be difficult to find another pilot in the world with such a record as this, starting, as it does, in 1911, when he joined the Bristol School as an instructor, and including over a year spent as chief test pilot at Farnborough. In April, 1916, he returned to Australia to assume command of the N.S.W. State aerodrome at Richmond. He left Sydney in August, 1919, with the rank of Captain, being appointed O.C. Aeroplane Repair Section at the Central Flying School, Point Cook, in which capacity he remained until his disappearance. Serjt. Dalzell commenced his flying career at Point Cook in April, 1916, as a rigger in No. 2 Squadron, and remained with it throughout its operations in England, France and Flanders. Returning to Australia in 1919, he joined the Aviation Instructional Staff in September of that year, transferring to the Australian Air Corps on its formation in January, 1920.

In 1917, for gallantry in rescuing the occupant of a burning aeroplane at South Carlton, near Lincoln, Serjt. Dalzell was awarded the M.S.M.

## UNITED STATES OF AMERICA.

### A New Naval Air Station in Hawaii.

It has been reported that it is proposed to build a Naval air station at Pearl Harbour, Honolulu, the U.S. Naval Base in Hawaiian waters, at a cost of £267,000.

### Target Practice.

The obsolete battleship U.S.S. *Indiana* has been used by the U.S. Naval Air Service as a target for bomb-dropping experiments.

### Italian Semi-Rigid Bought.

It has been announced by the U.S War Department that it has purchased for approximately 200,000 doll. the Italian semi-rigid airship, "Roma." The "Roma" or T.34 has a capacity of 1,200,000 cu. ft., is 400 ft. long, has six 400-h.p. Ansaldo San-Giorgio engines and a full speed of 125 km.p.h.

Major Thurnell, with an Air Service detachment, has been ordered to Italy to take the airship to America.

An air photograph of Cologne, showing the Cathedral and the Hohenzollern Bridge.

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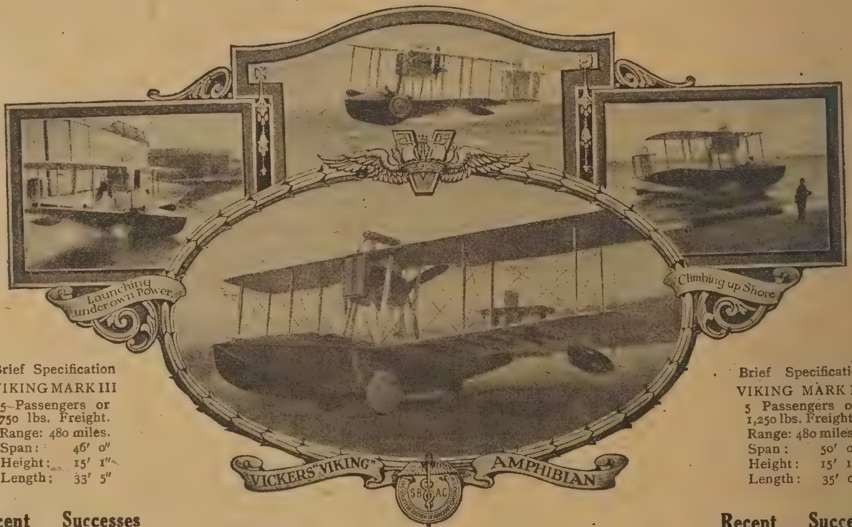

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5 Passengers or
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Length: 35′ 0″

**Recent Successes**

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

1. **Shortest time in "unsticking" from water.**
2. **Fastest time over a given circuit.**
3. **Climb to 1,000 metres.**
4. **Altitude with full load.**

**Recent Successes**

The Vickers Viking was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION September, 1920

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## THE WEEKLY COMMENTARY.

Certain lessons are extracted from the past history of transport development and applied to the present condition of aerial traffic by Capt. Sayers.

A description and some illustrations of the great Caproni triplane appear in this issue.

A note from a South African correspondent describing the types of aircraft which would find a ready sale in Colonial markets may be of value to British aircraft manufacturers.

A brief description of an aeroplane engine which, though built 20 years ago, will bear comparison both as to performance and as to weight per h.p., with many engines used in the war is published on page 260.

## AERIAL TRANSPORT IN THE LIGHT OF HISTORY.

The work of the pioneer is the making of history. That being the case it would seem to be wise for all would-be pioneers to give some slight attention to the history which has already been made, and to the errors and mistakes into which precedent pioneers have fallen. Yet it is rarely the case that pioneers have been served by past experience, and it has been consequently very unusual for pioneers to have reaped any substantial reward for their work. Particularly has this been the case in the history of transportation.

Pioneers of new methods of transport—of recent centuries at least—have been usually exponents of the use of some new form of vehicle, and in every case they have been so obsessed by the possibilities of achieving surprising performances by the use of the new vehicle that they have always sought to demonstrate the extreme possibilities of that vehicle rather than its capacity for the economical discharge of everyday duties.

### THE PREMATURE DEVELOPMENT OF PERFORMANCE.

Stevenson's "Rocket," by showing that it could haul passengers at 30 miles per hour, convinced the general public that railways were dangerous and costly luxuries. Fortunately for modern times certain people longer-sighted than the crowd recognised that the locomotive could also haul coal or other goods in 100 ton lots at 10 or 15 miles per hour, and thus the foundations of a sound commercial railway service were laid.

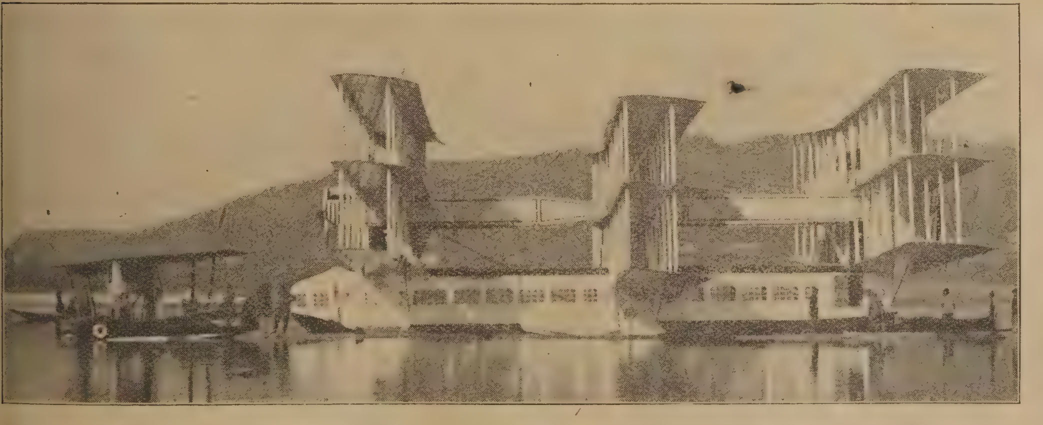
Brunel, one of the greatest engineers the world has yet seen, recognised that comfortable high-speed ocean transport over long distances was only possible if ships of great size were used. As a result the *Great Eastern* was built. From the purely engineering point of view the *Great Eastern* was a wonderful achievement. But Brunel had solved only the engineering problems of providing a type of vehicle suited for a traffic which not only did not exist, but for the handling whereof there were no facilities.

### THE DEPENDENCE OF EXPRESS UPON SLOW TRAFFIC.

High speed traffic upon rail, road, or sea, depends entirely for its existence upon the existence of a very much larger bulk of low speed traffic.

In the case of railways, it is the goods and the slow speed passenger traffic which defrays the cost of permanent way, of general traffic organisation, in fact, of the whole railway system, without which express trains could not be run at all. Does anyone imagine that trains such as the "Southern Belle" or the "Cornish Riviera Express" could be made profitable if no other type of traffic were handled upon the lines over which they ran?

Similarly with ships. The great passenger liners depend for their operation upon the existence of great harbour organisations, of proper coastwise lights and beacons, of a large volume of accurate information as to tides and currents, and upon a highly organised and well-trained body of professional seamen. Without the existence of the despised tramp or the slow cargo-carrier the high-speed liner would alone



THE BIGGEST YET.—The 3,200-h.p. 30 ton Caproni triple triplane afloat on Lake Maggiore. Some details of this machine will be found on page 256.

have to bear the costs of providing these essential auxiliaries to its operations, and it very obviously would cease to be a possible commercial undertaking.

Fast mechanical transport on roads would not to-day be a commercial proposition had it to pay interest on the capital cost and maintenance charges for roads specially built for the uses of such traffic alone. It relies for its success upon the fact that long generations of mankind have built up a network of roads designed originally for more elementary types of traffic, and have bequeathed them to the present generation, and that irrespective of the needs of the automobile, the roads of civilised lands must be maintained to provide the vital needs of a civilised community.

### A CONTINUALLY RECURRING CLAIM.

It has always been claimed by the inventors of new vehicles that the new development called for no great new route organisation. There can be little doubt that the ape who first found that he could walk upon his two hinder limbs claimed that the paths which served for four-footed progress more than sufficed for his more advanced method of auto transportation.

The man who first discovered the properties of the wheel, and he who first yoked to a wheeled vehicle an ox or an ass or the like motor doubtless pointed out that there was no necessity for the building of special tracks to make full use of his ingenious and highly efficient device.

And, in the prospectus of the first shipping company it can scarcely be doubted that the great advantage of having all the wide waters of the globe open to exploitation without any road-making costs was duly emphasised.

The first efforts to use steam for the acceleration of surface traffic took the form of road coaches, destined to avoid the costs of special tracks, but the danger both to the coaches themselves and to other traffic soon confined mechanical traction to special tracks.

### HISTORY REPEATING ITSELF.

To-day aerial transportation stands at the threshold of its career. As in the early history of all other forms of transport its exponents are unanimous in pointing out that it offers an unrivalled capacity for high speeds, and that it calls for no great expenditure of capital upon the provision of special routes. As with other developments in their rudimentary stages, efforts have been made to compete with the swiftest existing methods of transport, and to demonstrate that very high speeds are possible and safe. And as before the general public are affrighted by the dangers of this new form of transport, and doubtful of the value of the services which it can offer them.

As with every other type of transport, experience is now showing that, for the safe and economic use of aircraft in its most highly developed form, a very expensive and elaborate route organisation will be necessary.

### CONCERNING EXPRESS AIR MAILS.

Consider such a service as the London-Paris Air Express. It is generally admitted that so far traffic by air between these two cities has not sufficed to support an Air Line without some form of subsidisation. Why has this traffic been inadequate? Firstly, because the charges for Air Transport are high, secondly because people are frankly afraid of air travel.

Why are air transport charges high? Despite the extraordinarily low price at which surplus aircraft can be bought, reasonably efficient commercial aircraft and reasonably good aeroplane engines are extremely costly.

The aeroplane of to-day is a somewhat fragile and complicated piece of mechanism. It continually needs overhaul and renovation. Built and used as it now is, in small numbers, overhaul and renovation are again very costly, because labour and plant of a specialised and expensive type are required to maintain even a small air fleet in running condition.

Flown, as aircraft are flown to-day, over unorganised routes without really reliable meteorological and navigational information, the aeroplane must depend for its safety upon a high degree of skill on the part of its pilot, and a high order of conscientious workmanship on the part of those responsible for its maintenance.

### THE EXAGGERATION OF INEVITABLE DIFFICULTIES.

These factors are at the present moment inevitable and have to be faced. But is it not obvious that the importance of these factors is aggravated by the policy which has been pursued in the initial efforts to develop commercial aviation?

The choice of very high speeds of flight—speeds as high as are compatible with present-day knowledge of design, present-day engines, and the obvious necessity for reasonable cargo capacity—necessarily involve the use of aircraft of the most expensive type both to purchase and to maintain. Necessarily also it involves great risks in flying over unorganised routes in imperfect eleminates, and calls therefore for specially skilled piloting and specially careful maintenance of machines and engines. All these must be paid for. And, finally, because high speed means high costs, it means limiting aerial transport to a relatively small number of routes, whereon there seems a possibility of the traffic being willing to pay high charges.

### THE ONLY SOUND BASIS FOR DEVELOPMENT.

History seems to indicate that the sound development of an aerial transportation industry will only begin when it is realised that special express services can only achieve the most limited success unless there exists a proper traffic handling organisation, proper route organisation, and an aircraft industry which can economically manufacture economical aircraft.

Just as the steady demand for tramp steamships has maintained that shipbuilding industry which alone renders possible the production of great passenger liners at a relatively reasonable cost, so will the existence of a steady demand for more humdrum types of aircraft allow the building up of an industry which will be able to produce express passenger and mail air liners at reasonable prices.

Just as the goods and mineral traffic of this country have justified the expense of building up our great railway systems, and so rendered possible our high-speed express train services, so will a great fleet of aircraft engaged in the more normal pursuits of commerce be necessary to justify the costs of building up the great airway systems without which the high speed air services cannot function either safely or economically.

### HOW TRANSPORT NEEDS ACCELERATION.

The world has always been in need of increased rapidity of transport. The more rapid are communications the more rapidly can the processes of trade be carried on, and the more rapidly can the surplus of the world's production over its consumption—i.e., Capital—be used to still further increase production. Never has the world more urgently needed every possible aid to increased production than to-day. And therefore to-day offers greater opportunities than have ever before occurred for any improvement of its transport facilities. But—and this is the fact which most pioneers of improved transport have failed to recognise—the world urgently needs that traffic upon routes which now possess only slow and inefficient services should be speeded up to compare favourably with the routes which are now best served in this respect rather than that the disparity between the existing well-served routes and those less well served should be increased.

The economic value of relatively slow air services over routes now served by shipping alone, or by indirect railways, which would tend to allow business to be transacted over these routes with a rapidity equal to that now possible over routes served by direct and adequate rail or road communications would be enormously greater than services which merely accelerate already well-served routes.

Such routes are to be found over the whole of the British Empire, and many could doubtless be found in Great Britain itself. The Channel and East Coast ports of England would benefit immensely did they possess some means of communication with the opposite shore more rapid than that of a 10-knot steamship.

Aircraft of quite slow speed can supply such communications. At slow speeds the cost of transport per ton mile will be much lower than is possible at express mail rates. Such services competing only with a form of traffic subject always to delay by high winds or fog could afford to be rather less regular in operation under adverse conditions than can a service competing mainly with railway services.

Such services can be operated entirely over sea, using existing port facilities for the landing and the subsequent transportation inland of their cargoes. The problems of flying in fog, or at night over sea, are much simpler than over land. There are at least no hills to fly into, and providing that one is certain of being over sea, automatic "landing" gear of a very simple type will permit of safe alighting, even in a fog which reaches to the water.

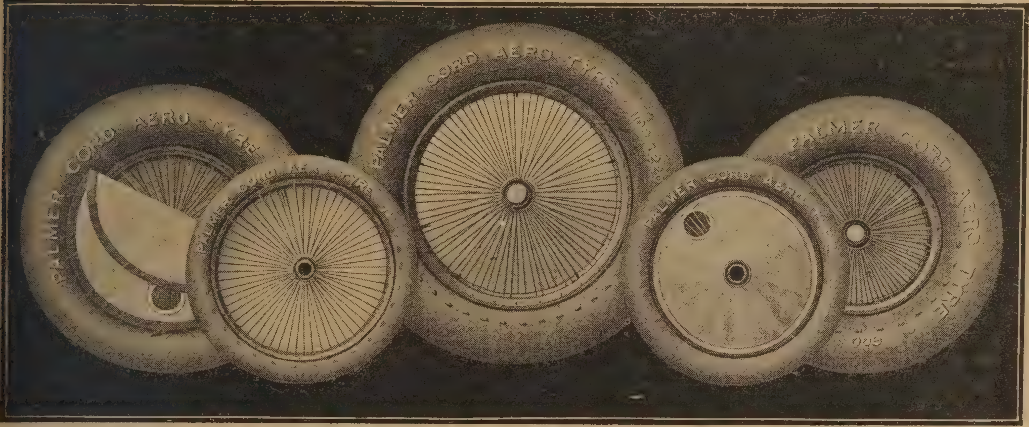
The value of rapid transport is no direct function of speed *per se*, but of the time which can be saved by the use of high speed, and routes served only by steamships offer opportunities for the saving of time to a really considerable extent, even on short passages.

Therefore, before loudly proclaiming that air transport cannot at present pay its way unaided, just because the efforts so far made to develop special types of high-speed services have not achieved success, the pioneers of this new method of transportation would be well advised to consider the possibilities which undoubtedly exist, of building up a system of economical air transport services upon badly served routes as a preliminary to attacking what is and always will be the most difficult of transport problems, the commercial operation of express passenger and mail routes.

W. H. S.

# PALMER

# LANDING WHEELS & TYRES



## STANDARD SIZES

| Tyre Sizes | Wheel No. | Hub | | Track Line |
|---|---|---|---|---|
| | | Length | Bore | |
| | | m/m | m/m | m/m |
| 300×60 | 16 | 111.12 | 25.4 | Central |
| ,, | 17 | 72.39 | 12.7 | Central |
| 450×60 | 30 | 89. | 31.75 | Central |
| ,, | 131 | 130. | 38.09 | Central |
| 575×60 | 21 | 160. | 28. | Central |
| ,, | 34 | 150. | 31.75 | 104/46 |
| ,, | 111 | 150. | 38.09 | 104/46 |
| 650×65 | 78 | 178. | 44.45 | 132/46 |
| ,, | 79 | 178. | 44.45 | Central |
| ,, | 100 | 178. | 38.09 | 132 46 |
| ,, | 101 | 178. | 31.75 | 132/46 |
| 600×75 | 21 | 160. | 28. | Central |
| ,, | 34 | 150. | 31.75 | 104/46 |
| ,, | 111 | 150. | 38.09 | 104/46 |
| 700×75 | 78 | 178. | 44.45 | 132/46 |
| ,, | 79 | 178. | 44.45 | Central |
| ,, | 100 | 178. | 38.09 | 132 46 |
| ,, | 101 | 178. | 31.75 | 132/46 |
| 700×100 | 77 | 178. | 44.45 | 132/46 |
| ,, | 92 | 185. | 55. | 135/50 |
| ,, | 95 | 185. | 55. | Central |
| ,, | 96 | 178. | 55. | 132/46 |
| ,, | 99 | 178. | 38.89 | 132/46 |
| ,, | 112 | 150. | 38.09 | Central |
| 650×125 | 119 | 178. | 55. | 132/46 |
| 750×125 | 77 | 178. | 44.45 | 132/46 |
| ,, | 92 | 185. | 55. | 135/50 |
| ,, | 95 | 185. | 55. | Central |
| ,, | 96 | 178. | 55. | 132/46 |
| ,, | 99 | 178. | 38.89 | 132 46 |
| ,, | 112 | 150. | 38.09 | Central |
| 800×150 | 82 | 185. | 55. | 135/50 |
| ,, | 85 | 185. | 55. | Central |
| ,, | *36 | 185. | 55. | 135/50 |
| ,, | *40 | 185. | 60.32 | 135/50 |
| ,, | 152 | 185. | 66.67 | 135/50 |
| 1000×150 | 131 | 220. | 66.67 | Central |
| ,, | 102 | 185. | 55. | 125/60 |
| 1000×150 | 141 | 250. | 80. | Central |
| ,, | 201 | 185. | 60.32 | 125/60 |
| ,, | 209 | 185. | 55. | Central |
| ,, | 210 | 185. | 60.32 | Central |
| 1000×180 | 148 | 220. | 80. | Central |
| ,, | 149 | 185. | 55. | Central |
| 900×200 | 107 | 185. | 55. | Central |
| ,, | 108 | 185. | 55. | 125/60 |
| ,, | 128 | 220. | 66.67 | Central |
| ,, | 137 | 250. | 80. | Central |
| ,, | 202 | 185. | 60.32 | Central |
| 1100×220 | 134 | 220. | 66.67 | Central |
| ,, | 136 | 250. | 80. | Central |
| 1250×250 | 133 | 250. | 80. | Central |
| 1500×300 | 115 | 304.8 | 101.6 | Central |
| ,, | 126 | 304.8 | 152.4 | Central |
| 1750×300 | 139 | 400. | 152.4 | Central |

* *Wheels No. 36 and 40 are of stronger type than the other wheels for 800 x 150 tyres.*

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N/NU.

## THE CAPRONI TRIPLE HYDRO-TRIPLANE.

This which is claimed to be the biggest thing of the sort afloat embodies the modern Italian idea of the tailless and elevatorless pluri-motored machine to the extreme. The tail simply *non est*, the only elevator consists of the small vanes between the hull and the (wing) floats and intended to assist the former to leave the water. The engines, each with its own airscrew, are eight.

The "Capronissimo," as it is called colloquially, is merely regarded as a somewhat oversized model by means of which Ing. Caproni may obtain reliable data as to the efficiency of multi-planes in juxtaposition from which to design a really large trans-Atlantic seaplane.

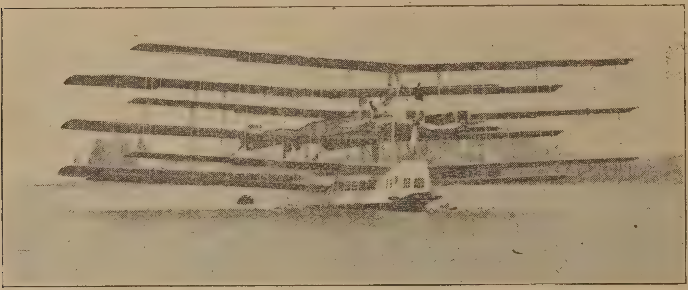
This present machine is, probably for the above purpose, arranged to be piloted by a single pilot, who can communicate with and receive news from the mechanics in charge of each of the two groups of engines by electric means (lamps?—T. S. H.), as too he can, independently of them, throw in or out any particular engine.

The principal features of the Caproni trans-Atlantic type are as follows:—

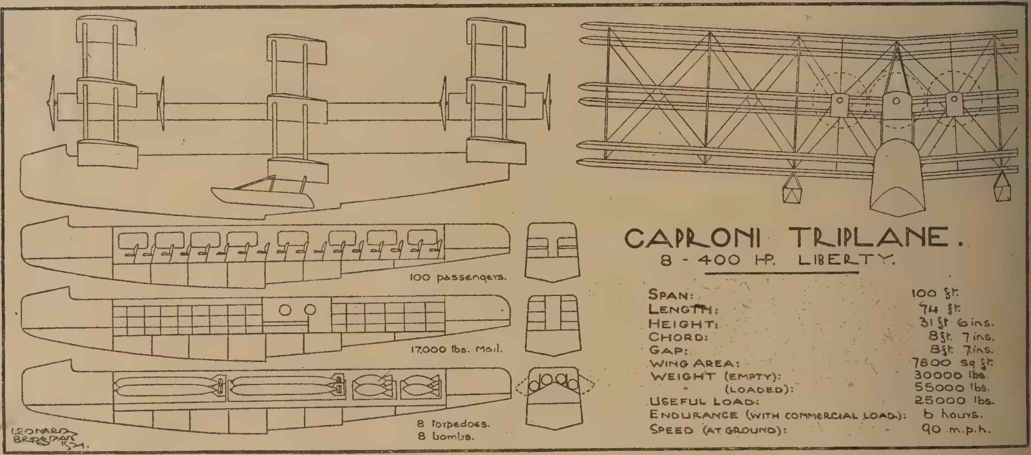
| | |
|---|---|
| Span | 33 metres |
| Total surface | 715 sq. m. |
| Length of hull | 22 m. |
| Weight empty | 14,000 kg. |
| Useful load | 10,000 kg. |
| Loading | 33 kg. per sq. m. |
| Engines | 8 Liberty 400-h.p. |

Accommodation for 100 persons seated.

T. S. H.



**Three-quarter front view of the Caproni Giant. The central four-bladed airscrew is driven by one engine in the central body. Each of the forward engine nacelles contains two engines, and carries a tractor and a propeller in tandem—making five forward engines. Aft there is one propeller amidships, and two tractors, one in each wing nacelle.**



## MORE JOURNALISTIC ACCURACY.

*Apropos* the impending fate of the R.A.F. airships, "An Expert" whose opinions were distributed by the Press Association to various newspapers of March 3rd and 4th, points out that Mr. Churchill's offer of a free gift of service airships to any commercial undertaking ready and able to make use of them, applies only to R.36, R.37, and R.33, and that R.80 is to be retained for the training of the American crew of R.38. In this respect the "expert" may be correct, though he fails to state what is to become of R.32, L.64, and L.71.

The same gentleman proceeds to point out that the three ships, R.36, R.37, and R.33, are entirely unfitted for commercial purposes, as they are devoid of passenger accommodation. This is by no means accurate. R.36 is now in the final stages of construction and is provided with a very elaborately designed and comfortable cabin for 50 passengers. R.37 is in a less advanced stage, and can be fitted in a similar manner at a relatively small cost. R.33 is an old ship, and is devoid of these conveniences, but could probably be modified if desired.

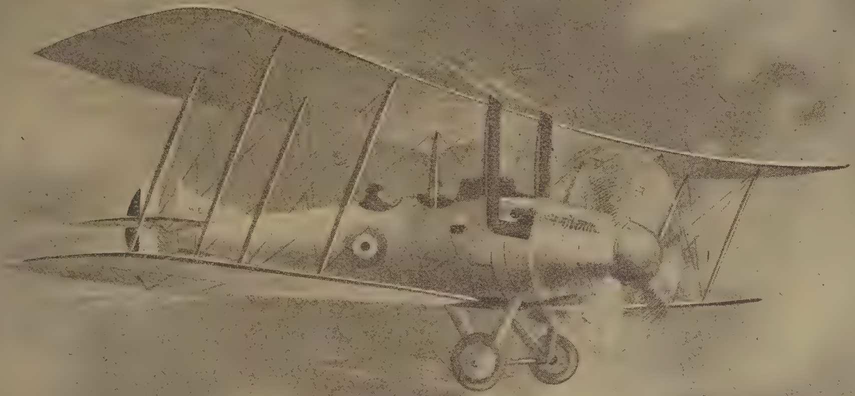
The dissemination of the views of such "experts" is naturally a potent aid to the revival of commercial aviation.

At about the same date as the Press Association expert so delivered himself, the *Times*, in a note upon the Fairey "N.4" and the Vickers "Valentia," made a number of amusing slips. The "N.4" was stated to be at 'Grays," whereas it is in fact at the Isle of Grain. Her hull is stated to have been designed by the late 'Colonel Lincoln Hope"—meaning the late Major Linton Hope.

The Valentia is said to have been built by Vickers Ltd., whereas she has been entirely constructed by S. E. Saunders, Ltd., of Cowes, to the designs of Vickers Ltd., except in regard to the hull, which was designed by Saunders. She is further stated to be equipped with Rolls-Royce "Condor" engines.

**THE VICKERS VALENTIA.—Built by S. E. Saunders, Ltd., for Vickers, Ltd., the Valentia is, as regards hull, to the designs of her builders, and as regards wings, etc., to the design of Vickers, Ltd. Laid down in 1918, this boat has now been completed at leisure and has just completed makers' trials on the Solent. She is fitted with two Rolls-Royce "Condor" engines.**

BEARDMORE



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AEROPLANES

## AIRCRAFT FOR COLONIAL USE.

One need scarcely describe at length the uses, and the advantages to be gained, by the employment of aircraft in the Colonies. Generally speaking, distances are great, and existing means of transport so poor, compared to European standards, that aeroplanes could be used to open up and develop these countries to an extent which otherwise would take decades. Apart from mail services between main centres of population there is an obvious market for suitable commercial types in the great farming and mining districts.

Taking the case of South Africa, in which the writer has had experience, it can be safely said there would be a considerable demand for the aeroplane as an essential form of transport much as there is to-day for the Ford car, if the requirements of prospective purchasers were met. But at the present time they are not being met, and firms who think they are going to sell £3,000 high-speed touring machines in the Colonies in any number are likely to be disappointed.

### THE TYPES REQUIRED.

Apart from the large trans-continental machines, the following three types seem to be mostly required :—

1. Mail and passenger-carrying machines of a type such as a Westland or a B.A.T. Limousine.
2. Three-seaters.
3. Light single-seaters.

The first type already exists, and doubtless in time the various Governments will make use of such machines for air-mail services. The third type would correspond to a solo motor-cycle, and would find quite a considerable market if it could be put on the market at a price to the purchaser of about £400. Needless to say the present converted war-type scouts are not suitable for many reasons.

It is, however, the three-seater type that strikes one as being mostly wanted.

In South Africa, as in probably all the other colonies, nearly 90 per cent. of all the cars used are four-seater Fords. Two-seaters are seldom seen. In all likelihood it would be the same with aeroplanes, and a three-seater would probably meet the general demand.

### SPECIFIC REQUIREMENTS.

The specific requirements for such a type of aeroplane, and as a matter of fact for most other types likely to succeed on the Colonial market, are considerably different from those machines now existing. The first, and by far the most essential requirement, is a large reduction in initial and in running costs. The writer, as representative for a British aircraft firm, has interviewed dozens of prospective purchasers, and, quite apart from any other consideration, until this requirement is met there is small likelihood of any business being done.

Apart from disposal war machines, which although fairly cheap in first cost are not generally suitable otherwise, one of the cheapest two-seater machines on the market costs ex works slightly under £1,000; to this must be added packing, insurance, freight, and customs, which to a purchaser, say in Johannesburg, would add another £350 to the price; and then in addition the firm strongly recommend one to buy spares which would amount to another £550. This makes the initial cost roughly £1,850.

One might just as well try to sell Rolls-Royce cars for colonial use. The initial cost to purchaser should not exceed £900, and he will not be ready to buy a lot of spares he may possibly never require. Spare part depots should be arranged by the firms wishing to do business.

Running costs, especially depreciation and insurance, must be considerably reduced. Petrol is 7s. to 8s. a gallon, so economy in fuel consumption is essential. High speeds are not necessary : in countries where the average speed of trains is about 15 m.p.h. a cruising speed of 50-60 m.p.h. for aeroplanes would be ample. This means a maximum speed of 75 m.p.h.

In South Africa all the hinterland lies on a plateau of from 3,000 to 7,000 feet high; machines and engines would require to be designed for continuous flying at this height.

This especially refers to ability to rise in a reasonable distance and to land slowly.

Mechanics are a very expensive luxury in the colonies, and good ones are seldom encountered, so both machines and engines must be made fool-proof.

A stationary engine is preferable to a rotary, and it should be arranged to run well on the ordinary petrol obtainable. Dual ignition is advisable, and a simple-self-starter is needed. Extra large wheels and a strong undercarriage are essential. It should be possible in case of need to add extra tanks instead of a passenger to increase the range of flight. There should be room for light luggage, and some form of simple mooring gear should be supplied.

Firms wishing to do business in the South African market would do well to have their catalogues printed in the dual language (English and Low Dutch). It is usually the case that people wish to see what they are expected to buy before completing the purchase, and therefore demonstration machines should be sent out. This refers to the future, when suitable machines are available, and aircraft firms are in a more prosperous state.

To sum up, the main requirements are :—

1. Cheaper machines.
2. Simpler and lower-powered machines.
3. Spare part depots and demonstration machines.
4. Machines properly designed and tested for the climatic conditions of use.

And generally one might finish by saying that to supplant the Ford you must offer not merely some substitute, but a better substitute.

IMOGES.

## A LECTURE AT MANCHESTER.

Under the auspices of the Royal Aeronautical Societ, Air-Commodore R. Brooke-Popham, the Chairman of the Society, delivered a lecture at the Memorial Hall, Manchester, on Wednesday evening, to members of the Manchester Association of Engineers and their friends, on "Some Problems in the Design and Operation of Aircraft." He stated that during the war, when money was of small account and time was everything, practical application got ahead of research, and under existing conditions progress would be slower and must proceed on firm conditions. There was an enormous field for development. In particular he thought there was a great future for the production of aircraft, designated amphibian, which operated on the surface of water as well as upon land, and also those which were specially arranged for landing on, and getting off, the decks of ships. It seemed likely that the British nation would be continually called upon to carry on small wars, and in these aircraft would be of enormous value in saving life and expense. He emphasised the necessity for the fighting services keeping ahead of scientific developments.

In proposing a vote of thanks Mr. Henry Pilling, President of the Association, expressed a hope that whatever amount of public money was allotted to the development of aircraft the greatest care should be taken to establish an active and intelligent and competent research department.

Following the lecture, Mr. John Lord, Director of A. V. Roe and Co., Ltd., Manchester, remarked that it has been stated on numerous occasions that the design of aeroplanes taken as a whole has not advanced to any appreciable extent during the period of war, but the great capability of machines of this day is entirely due to the improvement in the reliability of aeroplane engines, their increased efficiency and decreased weight per h.p. While admitting that this was substantially true, he gave some details of an instance of the real increase of efficiency of the aeroplane itself.

Mr. Lord referred to the extraordinary performances put up by the "Baby" Avro, a small sporting plane fitted with a 35 h.p. engine. Strangely enough, the actual engine was an engine which had previously been in A. V. Roe and Co.'s possession upwards of ten years ago, and had been installed in the first Avro tractor biplane wihch was constructed. There were not now any exact details of this machine's performance, but it probably had a flying speed of from 45 to 50 miles an hour.

The Avro "Baby" sporting machine has a maximum speed of between 85 to 90 miles an hour, and can carry out all manœuvres and stunts performed by modern scouting aeroplanes.

The first Avro biplane fitted with the 35-h.p. Green engine made a record flight of one hour and 20 minutes, a non-stop flight from Brooklands to near Brighton. This at the time was recorded as an extraordinarily good achievement, but ten years later, using the identical engine in one of the "Baby" machines, Lieut. Hinkler made a 9½ hours' non-stop flight between London and Turin. In addition to this performance this same machine, fitted with this identical engine, won the Aerial Derby Handicap two years in succession.

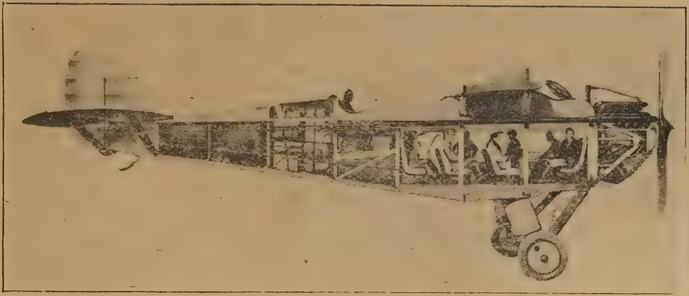
Although the improved efficiency of the machine is greatly responsible for this effort, it also bears out the contention that we now know more about the up-keep and running of aircraft engines—that is to say, we know how to install.

A lot has been said about the high cost of maintenance of aircraft; in this connection it was interesting to note that the "Baby" Avro had a petrol consumption equivalent to a light car. Lieut. Hinkler on his flight to Turin averaged 70 miles an hour, and his petrol consumption worked out at a fraction over two gallons an hour, giving at least 30 miles to the gallon.

## A DENIAL.

Mr. B. Yowell, Lieut., late R.A.F., wishes it to be stated that he was not responsible for, neither was he the pilot of, the Fairey aeroplane on the occasion when it recently went through the ice at Porjus, Sweden.

THE
DH18



The machine which can transport 8 passengers at a gross cost of 4^D each per mile.

*IMPORTANT:—By GROSS COST is meant fuel, pilot, insurance, maintenance and depreciation of machine and engine, all overhead charges, and every expense involved in running an air line.*

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# A NEARLY FORGOTTEN CHAPTER IN THE HISTORY OF AVIATION.

A well-deserved tribute to the work of Samuel Pierpont Langley as a pioneer of aviation has just been published by the Smithsonian Institute of Washington, in the form of a reprint of an address presented at a meeting of the Franklin Institute by Mr. Henry Leffmann.

This address consists in a brief account of the aeronautical work carried out by Langley at the Smithsonian Institute between the years 1877 and 1903.

Langley's work was of two descriptions: firstly an experimental investigation on the pressures upon flat and curved inclined surfaces, and secondly practical experiments on aeroplanes, firstly with models of gradually increasing size, and finally with a full-sized man-carrying craft, which were devoted to the study of the problems of stability, control, structural design, and finally the development of suitable power-plant.

His first models were rubber driven, and with these he achieved but very unsatisfactory flights. They sufficed to convince Langley that stable flight was possible, and the construction of small steam plants was then attacked. Very great difficulties were encountered with these, and it was not till 1896 that the practical difficulties of the construction of such a steam-driven model were shown to have been overcome by the successful trials of Model No. 5, which made flights up to three-quarters of a mile over the Potomac River. This model was of some 4 metres overall length, and of a weight of 22 lbs. The supporting surface was 40 sq. ft., and the engine h.p. was 1 at 115 lbs pressure.

Following this success the problem of the full-size machine was tackled, with the assistance of a Government grant of 50,000 dollars made in 1898. The steam engine was recognised as unsuitable owing to the weight of fuel and water needed for extended flights. No internal combustion engine of anything like the required lightness existed, but Langley recognised that this type alone offered any prospect of success.

After many inquiries a contractor was discovered who undertook to build an engine of 12 h.p. weighing not more than 100 lbs., and construction of an aeroplane for such an engine was put in hand at once.

The contractor failed dismally. Despite every effort and the loss of much money he was unable to deliver an engine of anything like the required power within the limit of weight specified, and finally abandoned the attempt.

Efforts were made to find a European maker to build the engine, but none would promise success, and therefore Mr. Charles M. Manly, Langley's mechanical engineer-assistant, undertook to attempt the work. Acquiring the parts built by the unsuccessful contractor, in a few months he had adapted them with such success that he obtained 18.5 h.p. for 108 lbs. engine weight. This was an engine cooled by wet cloths round the cylinder heads, and was of course only a preliminary step.

An engine for a quarter size model of the large machine was then put in hand, and was completed in the autumn of 1901, developing 3.2 h.p., and successful trial flights were made with it in October.

The large engine was completed in December, 1901, and the first tests were made in January of the following year. This engine was a five-cylinder radial water-cooled engine, with steel cylinders fitted with cast iron liners, automatic inlet valves, and had an epicyclic gear drive to a single cam for the exhaust valve control.

The crankshaft was of hollow steel, made in one piece, and the connecting rods were steel tubes, with one master rod whose big end encircled the crankpin. Upon the outer surface of this big end ran the sectional big ends of the four remaining rods, held in place by retaining guide rings screwed onto the end of the master big-end.

Only the upper ends of the cylinders were water-jacketed, the jackets being of sheet steel brazed on. Very light steel pistons, each with four rings, were fitted. These pistons had domed tops, and the cylinder heads were also domed, giving a combustion chamber form which compares favourably with many engines of much more modern design. Ignition was by battery and coil, one plug being fitted centrally in each cylinder head.

The difficulties overcome before successful results were obtained included the design of a suitable carburetter, of a five-cylinder H.T. distributor, of suitable sparking plugs, and it was even necessary to manufacture H.T. wire by putting rubber tubing over available low tension wires.

The engine had a bore of 5 in., a stroke of 5½ in., and it weighed 124.17 lb. Complete with two fly-wheels, coil and batteries, carburetter, inlet manifold, water-pump, water-tank and radiator the weight was 185¼ lb.

This engine on its earliest tests was not allowed to develop more than 40 h.p. On its second set of tests it was opened up to 51 h.p. for one hour. In 1904, when it was obvious that it would be impossible to raise funds for further trials of the aeroplane for which it was designed, it was decided to enter it for a prize of 2,500 dollars for the lightest engine, which was offered at the St. Louis Exposition. The conditions of the competition were 1 hour run at full power, followed by a durability test of ten hours. Durability tests were therefore made before sending the engine to St. Louis, and three separate runs, each of 10 hours (except for 10 min. stop to fill the oil tank and change the ignition batteries), were made at an average of 52.4 h.p. During these tests the speed never varied more than 10 r.p.m., and the pull on the brake torque arm was constant to within about four per cent.

The competition was abandoned because no other entries were received.

Had Langley's efforts led to no further results, the production of a power-plant of 50 h.p. for 3½ lb. per h.p. in 1901 should entitle him to lasting fame.

The aeroplane for which this engine was designed was a tandem monoplane with a cruciform tail, driven by two airscrews shaft-driven from this engine. Flights were twice attempted, the first on Oct. 7th, 1903, and the second on Dec. 8th, of the same year.

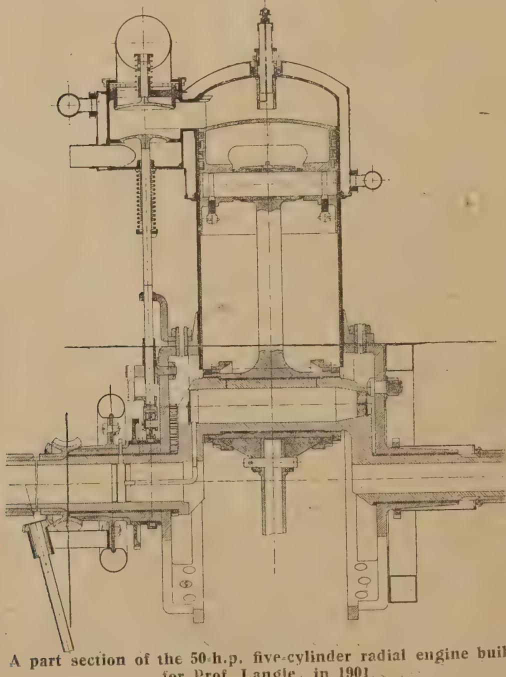
The machine was launched by a catapult from the top of a house-boat, with Mr. Manly in the pilot's seat. On each occasion the machine fouled the launching-ways and was caused to dive into the water.

The American Government refused further funds for experiment. Langley could not expect further support from the Smithsonian Institute, and efforts to obtain support from wealthy Americans failed because Langley would not consent to grant commercial rights in an invention developed at the expense of the public to contributors to the last phases of its perfection.

In 1906 Professor Langley died, a deeply disappointed man.

In 1914 Glenn H. Curtiss received permission to test the machine, which was preserved in the Museum of the Smithsonian Institute. It was overhauled at the Curtiss works, fitted with hydroplane floats—an added 300 lb. of weight—and on May 28th, 1914, under the power of the original engine, the machine left the waters of Lake Keuka, made a straight flight of 150 yards and landed unharmed. A little later a Curtis engine of 80 h.p. and a modern airscrew were fitted, and with a Mr. Doherty as pilot, it was demonstrated that the Langley "Aerodrome" was a practicable, stable, and controllable aircraft.

The United States of America claim to be a progressive and enlightened community. A little reflection upon the above history should suffice to show that they do not, in regard to these qualities, differ fundamentally from their relations on the Eastern shores of the Atlantic.



A part section of the 50-h.p. five-cylinder radial engine built for Prof. Langley in 1901.

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*Designers and Manufacturers of Aircraft and Aero Engines,*
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## THE FAIREY AVIATION CO., LTD.

It is announced that the Fairey Aviation Co., Ltd., of Hayes, Middlesex, and Hamble, Hants, went into voluntary liquidation and were wound up on March 10th. A new company, bearing the same title, has been registered and will take over the liabilities and assets of the original concern, and will carry on the business of aircraft manufacturers without interruption.

The Fairey Works are extremely busy, and are likely so to remain for a long time, upon aircraft work—largely to the order of the Air Ministry. The proceedings reported above are purely of the nature of a re-organisation, designed to put upon a permanent basis a business which was commenced during the war, and under somewhat uncertain conditions.

That business has flourished exceedingly, and the present step is calculated to ensure the continuance of that prosperity. The notification of this change appears under the heading of Company Notices.

## FROM AMERICA.

### Some New American Efforts.

A correspondent in the United States writes that the Wittemann-Lewis Company, the technical department of which is staffed very largely by British aircraft engineers, is actually engaged on aeroplane work, despite the stagnant state of aviation in America. The chief new product of the firm is a large triplane fitted with six "Liberty" engines. Two of them are in tandem on each side of the fuselage on the lower plane, and there is one driving a tractor screw on each side of the tandem nacelle, all six engines being on the lower plane.

The machine has a monocoque fuselage, which gave the visitor the impression of appearing to be somewhat disconnected from the wing cellule. This is almost inevitable in a machine in which the wings are not actually built into the fuselage. It was also noted that, despite the size of the machine, there will be no servo-motor to help the pilot on the controls. A peculiarity of the machine is that the middle plane has a greater span than the top and bottom planes.

The Wittemann-Lewis Company are also engaged in converting disposal D.H.4s for the U.S. Mail Service. The method of alteration is simply to remove the gun-ring and fit an ordinary cockpit arrangement. A steel-tube undercarriage of the R.E.8 type is fitted and is rigged rather forward of the usual English position. The steel tubes have balsa wood fairings.

The visitor was not favourably impressed by sundry alterations in minor fittings, such as wing-strut fixings. There seems to be a tendency in the States to fit gimcrack small parts in aeroplanes. This possibly accounts for the prevalence of aeroplane accidents in the States. The aforesaid D.H.4s, although they have only existed for a year or two and have not been used, seem to have lost all their varnish, which appears to indicate that the States still have a good deal to learn on the subject of dope and paint for aeroplanes.

The Curtiss Company appear to have a fair amount of work in hand. They have machines in hand for experimental work and one order for five Curtiss "Eagles" fitted with one "Liberty" engine apiece instead of two or three Curtiss K.12s. It is alleged that with the single engine they can do 100 miles an hour out of it and good reliability.

It is said that the Curtiss people have also built two cantilever aeroplanes, each with two 200-h.p. Hispanos in the wings, and two-stepped boat bodies. The tails of these machines are carried on outriggers, as in the Curtiss trans-Atlantic boats.

## TRADE NOTES.

### A Chance for a British Aeronautical Engineer.

An American gentleman who has long been connected with the Aircraft Industry requires the services of a young and ambitious British Aeronautical engineer who would be willing to start work in America at a modest salary with a fair certainty that, if he made good, a really substantial position would result.

The man required must be well informed as to the latest developments of aeronautical engineering, preferably with some knowledge of both lighter and heavier than air craft, a fair engineering experience, and a readiness to work.

The Editor of THE AEROPLANE would be glad to hear from anyone to whom this prospect appeals, and to put him into communication with the gentleman in question.

### The Future of the British Magneto.

The question of the protection of certain so-called Key Industries which is proposed by the Government may arouse a certain amount of argument upon purely economic grounds. It is pointed out by Mr. Peter Bennet, chairman of the British Ignition Apparatus Association, that the claim of the British Magneto Industry to be protected from the competition of German manufacturers rests upon grounds which remove it from such discussion.

Before the war the British Magneto Industry was practically non-existent—the total output was only about 25 per week in August, 1914. On the outbreak of war temporary supplies were obtained from America pending the organisation of British sources of supply.

**Mr. Peter Bennet, chairman of the British Ignition Apparatus Association.**

In the middle of 1915 the Admiralty took up the problem of magneto supplies, appointing Lt. (now Lt.-Col.) W. A. Bristow to co-ordinate efforts, and under his direction it was found possible to co-ordinate the work of British manufacturers to such effect that in October, 1918, the British output of magnetos for aero engines alone was 18,000 per month.

This enormous increase of output was undertaken by the manufacturers with a full knowledge of the risks to the capital involved if their industry were to be subjected after the war to unrestricted German competition. This danger was represented to the Government, and Government assurances were given that this, and other similar industries, should be adequately protected from unfair competition during the Peace.

The claim that the British Industry should be adequately protected therefore is merely a claim that the assurances which led to its foundation should be carried out. There are fourteen firms engaged in the manufacture of British magnetos—a fact which shows a degree of competition sufficient to protect the consumer from unduly high prices. The quality of British-built ignition apparatus has been amply shown to be of the first order by war experience, and therefore the consumer is equally protected against the risk of inferior supplies.

### British Industries Fair.

At the British Industries Fair held at the White City from Feb. 21st-March 4th there were many exhibits of considerable interest to those aeronautically inclined.

Chief among these was the stand jointly occupied by Cellon (Richmond) Ltd., and Woodart Ltd. The peace-time production of Cellon, known as "Cerric," is here shown applied to all sorts of conditions of household interest. A special process of applying Cerric in various colours to such common objects as flower-pots to make bowls for table centres and to panels is shown in result.

One was informed that some of these very startling panels were made for public-houses, but when intending public-house patrons saw these, they decided that they had already had enough to drink; which certainly shows the efficacy of the process.

Cerric is also shown applied as polish to dinner tables. It has the advantage over ordinary polish in that it is not affected by hot dishes or liquids spilt thereon. Cricket and hockey balls so treated are impervious to the weather.

At the stand of Shenstone and Co., Mr. Keith Davies, of early Brooklands memories, was to be seen; and D. M. Davies who used to make air-screws, and whose post-war product is furniture, put up an excellent show. There were many exhibits of model aeroplanes and kites.

## COMPANY NOTICES.

FAIREY AVIATION, LTD.—Private company. Registered March 9th. Capital, £100 in £1 shares. To adopt an agreement with the Fairey Aviation Co., Ltd. (incorporated in 1915), and the liquidator thereof, and to carry on the business of manufacturers of and dealers in waterplanes, aeroplanes, and aerial conveyances and aircraft of all kinds. The subscribers (each with one share) are:—C. R. Fairey, Grove Cottage, Iver, Bucks, aeronautical engineer; F. G. T. Dawson, Sydney Lodge, Hamble, Hants, aeronautical engineer. The first directors are:—C. R. Fairey (chairman), F. G. T. Dawson, and C. O. Crisp (all permanent), and others to be appointed by the subscribers. Remuneration: £250 each per annum (chairman £300), free of income tax. Solicitor: C. Crisp, 17, Throgmorton Avenue, E.C.

### Mortgages, Charges and Satisfactions.

BRITISH EMAILLITE CO., LTD.—Land Registry charge on 9a, Hythe Road, Hammersmith, dated February 34th, 1921, to secure all moneys due or to become due from company to London Joint City and Midland Bank, Ltd.

BURTON AIRCRAFT AND MANUFACTURING CO., LTD.—Mortgage dated March 1st, 1921, to secure all moneys due or to become due from company to London Joint City and Midland Bank, Ltd., charged on certain properties in Lichfield Street, Burton-on-Trent.

CIVIL AVIATION—SEASON 1921.

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TO promote British Civil Aviation and in order to supplement the Government Subsidy, Messrs. Handley Page, Limited, as Managing Agents for the Aircraft Disposal Co., Ltd., beg to announce that they are prepared to supply to approved, experienced British Pilots a limited number of machines on exceptionally favourable terms. Pilots desirous of undertaking joy-rides, exhibition flying, or of establishing transport services are invited to apply for full particulars.

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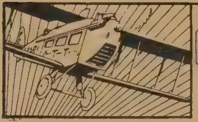

# COMMERCIAL AERONAUTICS
## AND CIVIL AERIAL TRANSPORT.

## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### OFFICIAL NOTICES.
### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; C.T.—Compagnie Transaerienne; G. E. A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie; M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

MARCH 7th:

M.A., Spad, F-CMAY, London-Paris, 12.45-14.15, G.&M., Nil, Le Sec.
S.N.E.T.A., DH4, O-BADO, London-Brussels, 12.47-15.05, G.&M., Nil, Van Opstal.
G.E.A., "Goliath," F-GEAC, London-Paris, 13.05-15.20, G., 2, Patin & 1.
S.N.E.T.A., DH9, O-BIEN, Brussels-London, 12.40-15.30, G.&M., 1, Delzenne.
G.E.A., "Goliath," F-GEAD, Paris-London, 12.50-16.08, G.&M., 5, Labouchere & 1.

MARCH 8th:

M.A., Breguet, F-CMAB, London-Paris, 13.10-15.25, G.&M. 1, Le Men.
M.A., Breguet, F-CMAH, London-Paris, 13.20-15.34, Nil, 2, Challoux.
S.N.E.T.A., DH9, O-BIEN, London-Brussels, 13.20-15.45, G.&M., 1, Delzenne.
M.A., Breguet, F-CMAI, Paris-London, 12.20-15.15, Nil, 3, Le Sec.
M.A., Breguet, F-CMAG, Paris-London, 12.20-15.35, M., 2, Malfanti.
S.N.E.T.A., DH4, O-BADO, Brussels-London, 13.15-16.10, G.&M., Nil, Van Opstal.

MARCH 9th:

G.E.A., "Goliath." F-GEAD, London-Paris, 13-00-15.35, G.&M., 8, Labouchere & 1
S.N.E.T.A., DH4, O-BADO, London-Brussels, 12.27-14.35, G.&M., Nil, Van Opstal.
G.E.A., "Goliath," F-GEAC, Paris-London. 12.55-15.55, G.&M., 8, Favreau & 1.
M.A., Salmson, F-CMAE, Paris-London, 13.35-16.00, G., Nil, Challoux.

MARCH 10th:

M.A., Breguet, F-CMAI, London-Paris, 12.37-15.33, M., 1, Le Sec.
M.A., Breguet. F-CMAG, London-Paris, 12 39-15.35, Nil, 3, Malfanti.
M.A., Salmson, F-CMAE, London-Paris, 12.38-15.32, G., Nil, Challoux.
M.A., Breguet, F-CMAF, Paris-London, 12.45-15.08, G.&M., Nil, Le Men.
M.A., Spad, F-CMAZ, Paris-London, 12.47-15.32, Nil, 5, Casale.
S.N.E.T.A., DH4, O-BATO, Brussels-London, 12.30-15.04, G.&M., Nil, Wouters.

MARCH 11th:

M.A., Breguet, F-CMAF, London-Paris, 12.30-15.40, G.&M., 2, Le Men.
M.A., Spad, F-CMAZ, London-Paris, 12.44-15.37, G., 3, Casale.
S.N.E.T.A., DH4, O-BATO, London-Brussels, 12.55--5.15, G.&M., Nil, Wouters.
M.A., Breguet, F-CMAH, Paris-London, 12.42-14.55, Nil, 3, Malfanti

MARCH 12th:

M.A., Breguet, F-CMAH, London-Paris, 12.38-15.32, G.&M., 3, Malfanti.
G.E.A., "Goliath," F-GEAC, London-Paris, 12.45-16.52, G., 7, Favreau & 1.
S.N.E.T.A., DH4, O-BALO, Brussels-London, 12.12-15.00, G.&M., Nil, Delzenne.
M.A., Spad, F-CMAW, Paris-London, 12.36-14.38, M., 2, Le Sec.
M.A., Breguet, F-CMAB, Paris-London, 12.40-15.02, G., 3, Challoux.

MARCH 13th:

M.A., Breguet, F-CMAE, London-Paris, 11.08-14.15, Nil, 4, Challoux.

### Air Port Statistics.

CONTINENTAL

Croydon:—Machines 31; Passengers 69; Crew 35; Total Personnel 104.

### Inland Flying at Croydon.

March 7th.—L.A.S., DH6 to Leatherhead (Knowles).

March 8th-11th —Nil.

March 12th.—I.A.L. "Vimy" joy-riding (Barnard); L.A.S., DH6 and Avro from Leatherhead and joy-riding (Ortweiler and Knowles); S.F.S. Avro joy-riding (Muir).

March 13th.—I.A.L. "Vimy" joy-riding (Barnard); L.A.S. DH6 and Avro joy-riding and to Leatherhead (Ortweiler and Knowles); S.F.S. Avro joy-riding (Muir).

### The London Terminal Aerodrome.

The French machines are now arriving and departing with full loads owing to reduction of prices. At the present rate of increase they will soon be able to make a profit without the subsidy, especially when they get extra machines going. Already far more seats are applied for daily than are available, and, if as rumour says, the price comes any lower, there should soon be a demand for a half-hourly service.

A new aerodrome marking light erected by the Gas Accumulator Co. was successfully tested on Friday night. Airship G-FAAG (the R.33) was to fly over on Tuesday night to report on the visibility of this.

On Saturday Mr. Knowles came over on the D.H.6 from Leatherhead, followed about an hour later by Mr. Ortweiller on the Avro, with Mr. Chapman as passenger. Both machines were flying all day, and Mr. Ortweiller gave several very pretty exhibitions, on the first of which he kindly took oneself.

Mr. Muir came out for the first time on Saturday with the Avro (G-EAWJ) belonging to the Surrey Flying Services, and was later taking passengers on this.

Mr. Barnard also had out the "Vimy."

On Sunday to Kenley with Mr. Muir on his Avro. That aerodrome had a nice Sunday somnolent look very different from this time three years ago.

Mr. Chapman, unfortunately, being without a ground engineer (attention is drawn to his advt. for same in this issue), was unable to take paying passengers in his machine, but nevertheless he very sportingly kept the Avro in the air to entertain the crowd.

Mr. Barnard carried a goodly number of passengers in the "Vimy," one take-off being rather sensational.

An old lady, watching the smoke coming out of the funnel-like exhaust pipe of the Breguet, could not make out how the pilot could coal his fire in the air if the passengers were between him and the engine. She does not believe even now that aeroplanes are petrol driven. Probably she is only thinking slightly in advance of her time.

It is hoped to hold a big race meeting at the aerodrome on Easter Monday, but this rather depends on whether any sportsman can be found to put up a prize of £100 or so to ensure a good entry.—G. D.

### Brooklands.

The Vickers-Napier ambulance "Vimy" went to Martlesham Heath on the 8th, after being cinematographed while on its final flight at Brooklands. The red crosses painted on the wings and fuselage indicate to the intelligent observer the purpose of the machine.

The " Viking IV " is progressing well, and the hull has taken shape, plus "Consuta" covering. One understands that four "Viking IVs" have been ordered by the Dutch Government.—J. F. S.

### Woking.

A rumour that Martinsyde, Ltd., have an order for aeroplanes was confirmed by an official of the firm the other day, and one believes that the demand is for a few "F.6s" from Spain. A few additional hands, it is said, have been engaged to construct the machines.—J. F. S.

PASSENGER FLIGHTS AT CROYDON AERODROME—10/-
RING UP: PURLEY 1180. (EXTENSION 14.)
FLIGHT, INCLUDING CHARABANC FROM LONDON AND RETURN — 17/6.
INSTONE AIR LINE.

# FOREIGN INTELLIGENCE.

## DENMARK.

The Danish correspondent of The Aeroplane writes :—

### Surrender of German Aircraft.

"Det danske Luftfartselskab" has had to give up its Friedrichshafen seaplane, which the Germans had sold cheaply, but unauthorised according to Allied views. Accordingly it is uncertain whether the Copenhagen-Warnemünde service will be resumed in April in conjunction with the air line to London.

### An Agreement Between Great Britain and Denmark.

The Danish Foreign Office announces that an agreement was signed between the Governments of Great Britain and Denmark on Dec. 23rd, 1920, *re* the traffic of private and commercial aircraft of both countries over the respective regions. Prohibited areas are permitted for military or public safety reasons and aircraft airworthiness.

Pilot certificates and log books are prescribed. A wireless installation may only be carried with special permission. The authorities of both countries are entitled to investigate the passenger and goods lists on starting and landing.

Aircraft leaving or arriving in Denmark must, for the present, use the Christianshavn drill ground (for landgoing aircraft) or the flying-boat station (naval), while Lympne, Croydon and Cricklewood are available in England for landgoing aircraft and Felixstowe for naval aircraft. The Danish frontier may be crossed everywhere, the British one only between Folkestone and Dungeness, for landgoing aircraft or between Orfordness and the Naze for seagoing aircraft.—E. H.

## DUTCH EAST INDIES.

According to the *Dutch East Indian Archipelago Fortnightly Commercial Review* a Mr. Hussni, a Turkish aviator who fought during the war against the Allies, and afterwards settled in Holland, has now arrived in Java, where he plans to open a school for aviation.

From the same source it appears that M. Poulet, who last year attempted to fly to Australia on a Caudron G.4, is at present flying in Borneo.

## ITALY.

The Italian correspondent of The Aeroplane writes :—

The adapting at Rome of the Caproni 600-h.p. biplanes as two-engined passenger carrying craft is the news of the month. Ing. Sarri, of the S.A.I.A.M., who engineered the change, has had the machines tested by representative pilots of every school of airmanship, and everyone proclaims the type "it." In the place of the big central engine-room accommodation for some dozen passengers has been arranged which the two lateral I.F.V.6 engines seem scarcely to feel.

The machine has become, it is claimed, the most economical transport plane existing. It will be remembered that during the war its Italian enemies called it ineffective *technically*, though its efficiency for the work it set out to do was never doubted.

The Caproni triple hydro-triplane is now on the water.

### A Levantic Seaplane Circuit.

The Venetian Aero Club announces a grand Levantine circuit for seaplanes this year, starting from and returning to Venice *via* Fiume-Athens-Salonika-Constantinople-Smyrna-Athens-Brindisi.

Considerable activity is reported from Rome, Naples and the South, and from the seaplane firms.

### A New Use for Airscrews.

A new use for airscrews scored a great success at a recent motor-car road race on a hilly circuit in Italy. Neatly planted edge to edge with a slight overlap they made an excellent substitute for those oak palings at one time not uncommon in southern counties, besides looking quite up to date and really being useful.

Wicked waste with the present dearth of dry firewood.

### Arabian Orders.

On Nov. 30th Cameri was visited by H.M. the Emir (Feishal) of Syria, accompanied by various notabilities.

After an inspection of the numerous machines and some exhibition flying the party left, arrangements having been made for the training of forty Arab officers. Direct business result of the Tokyo flight?

## JAPAN.

A correspondent of The Aeroplane in Japan writes :—

### Rebel Aborigines Fear Aeroplanes.

A recent air demonstration carried out by the aerial police department of the Formosan Government had a greater effect than was hoped for upon the insubordinate aborigines. The Koshabokan tribe, one of the fiercest groups of Formosan head-hunting aborigines, offered to surrender, and several other tribes also submitted at the same time.

### New Air Lines to be Established.

Mr. Yukiteru Ozaki has announced that he will open an air line between Tobashi, Miye Prefecture, and Toyama, and the Oriental Park Co. will join with him and establish the company with a capital of 10,000,000 yen.

Another air line will also be opened between Tokio and Osaka and take both passengers and cargo. The company will be established, also with a capital of 10,000,000 yen, by Mr. Ryokan Tachibana, with the help of Mr. Takichi Hashimto.

The former will begin to operate in March of this year.—N. K.

## NORWAY.

### The Christiania Meeting.

The Aviation Meeting at Christiania has not proved the success that was anticipated, owing to the number of crashes that took place.

No Finnish pilots took part in the meeting owing to their being forbidden to cross Sweden.

As the result of a subscription raised by the Swedish Aero Club, five Swedish army pilots were chosen to take part in the meeting : Lieuts. Gardin, Adilz, Segebaden, Philipson, and Sjorholm.

Lieuts. Gardin and Adilz left Umea at 10 a.m. on March 1st and landed at Falun at 5 p.m. out of petrol. They left Falun the next day and arrived at Kjeller, outside Christiania, on the same day. They were flying 2-seater Swedish built S.18s (260-h.p. Mercédès).

Lieuts. Segebaden, Philipson and Sjorholm left Malmstadt on March 1st for Kjeller on Swedish-built Phœnix scouts (200-h.p. Benz).

Lieut. Sjorholm arrived at Kjeller in 2½ hours, Lieut. Philipson landed at Arvika with engine trouble and left ten minutes later, eventually arriving at Kjeller, while Lieut. Segebaden landed at Arvika with a broken wire. He returned to Malmstadt for another machine and started next day at 10 a.m., landing at the Norwegian capital 3 hours later. He then took the train back to Arvika and flew his original machine, now repaired, on to Christiania.

From later news received, it appears that all the Norwegian pilots crashed, two badly, and of the five Swedish pilots present, one, Lieut. Segebaden, was killed. He was spinning a Phœnix Scout when the left-hand bottom plane folded up and let him down from 300 metres. Only one Swede flew back to Malmstadt, so it appears from the little news received that the meeting had its very fair share of "bois cassé."

The prizes, amounting to 5,000 kr., with cups, two of which were presented by the Aero Club of Sweden, were all awarded to Swedish pilots, for what reason it at present is not known, except that perhaps Sweden preserved more machines, to wit, one, in a flying condition than Norway.

It is hoped that further information will be forthcoming, that will give an account of the actual meeting, and perhaps account for the allocation of the prizes.

## UNITED STATES OF AMERICA.

### Air Mail Across the States in 33 Hours.

The Air Mail Department of the United States Post Office on Feb. 23rd transported six sacks of mail from San Francisco to New York in 33 hours. The total distance of 2,666 miles was covered by relays of aeroplanes in 25 hours, 53 mins. flying time, showing an average speed of 103 m.p.h. Letters were actually delivered 37 hours after they were posted on the opposite side of the American continent.

The quickest time hitherto recorded for trans-continental mail was 72 hours by a combination of special mail train and aeroplanes. Before the introduction of aircraft on the Atlantic-Pacific mail route it took 4½ days for letters to travel from New York to San Francisco.

# THE ROYAL AERONAUTICAL SOCIETY.

## WEEKLY NOTICES.

**Lectures.**—The next lecture, which is the last of the present session, will take place at the Royal Society of Arts, John Street, Adelphi, at 5.30 p.m., on Thursday, March 17th, when Capt. D. Nicolson, M.I.N.A., Associate Fellow, will read a paper on "Flying-Boat Construction."

**Wilbur Wright Lecture.**—The date of the Annual Wilbur Wright Lecture, which is to be read by Major G. I. Taylor, has been fixed for 8 p.m. on Tuesday, April 12th, at the Royal Society of Arts, John Street, Adelphi. The title of the paper will be announced later.

**Air Ministry Conference.**—Capt. G. de Havilland, O.B.E., and the Secretary attended on behalf of the Society the Conference on Subsidies for Cross-Channel Aerial Transport Companies, held at the Air Ministry on Thursday, the 10th inst.

**Engine Committee.**—A Meeting was held at the Society's offices on Friday, March 11th, to discuss the question of the type of engine and disposition of power-plant required for an aeroplane carrying mails (a) between London and Paris, and (b) over a 500 mile route. The following gentlemen attended :—Lieut.-Col. O'Gorman (in the Chair), Col. L. F. R. Fell, Capt. G. de Havilland, Major G. H. Norman, Mr. H. Ricardo, Colonel F. Searle, and Mr. R. McKinnon Wood.

Royal Aeronautical Society, W. Lockwood Marsh,
7, Albemarle Street, W.1, March 12th, 1921. Secretary.

# THE ROYAL AERO CLUB.

## ANNUAL GENERAL MEETING.

The Annual General Meeting of the Members of the Royal Aero Club of the United Kingdom will be held on Wednesday, March 30th, 1921, at 3, Clifford Street, New Bond Street, London, W.1, at 6 p.m.

### COMMITTEE.

The following Members have been nominated for election to the Committee:—Lieut.-Col. John D. Dunville; Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Lieut.-Col. F. K. McClean, D. C. MacLachlan; Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F.; Flight-Lieut. D. G. Murray; Lieut.-Col. Alec Ogilvie; F. Handley Page; Rear-Admiral Sir Godfrey M. Paine, K.C.B., M.V.O.; T. O. M. Sopwith; Viscount Tiverton.

### GREAT BRITAIN TO AUSTRALIA FLIGHT.

It has been decided to present the Gold Medals of the Club to Sir Ross Smith and Sir Keith Smith at the Annual General Meeting of the Club on Wednesday, 30th March, 1921, at 6 p.m.

### RACING COMMITTEE.

A Meeting of the Racing Committee was held on Wednesday last, 9th March, 1921, when there were present:—Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S. (in the Chair); Major-Gen. Sir Sefton Brancker, K.C.B.; Col. F. Linlsay Lloyd, C.M.G., C.B.E., and the Secretary.

Hendon Aerodrome.—The arrangements between the Club and the Grahame-White Company for the use of Hendon Aerodrome for aviation races were approved.

Aerial Derby, 1921.—It was decided to hold the Aerial Derby on Saturday, 16th July, 1921, at the Hendon Aerodrome.

Jacques Schneider Race, 1921.—It was reported that the Aero Club of Italy had decided to hold the race at the end of July instead of September. It was decided to endeavour to get the date altered to September.

Proposed Cowes Meeting.—The report of Major-Gen. Sir Sefton Brancker and the Secretary on their visit to Cowes was received, and it was decided to proceed with the arrangements for holding seaplane races during the Cowes Yachting Week.

Gordon Bennett Balloon Race.—It was decided that the Club should make three entries for the Gordon Bennett Balloon Race to be held at Brussels in the autumn.

### COMMITTEE MEETING.

A Meeting of the Committee was held on Wednesday last, the 9th March, 1921, when there were present:—Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S. (in the Chair); Major-Gen. Sir Sefton Brancker, K.C.B.; Mr. Ernest C. Bucknall, Squadron-Leader T. O'B. Hubbard, M.C., R.A.F.; Col. F. Lindsay Lloyd, C.M.G., C.B.E.; Lieut.-Col. F. K. McClean; Lieut.-Col. Alec. Ogilvie; Lieut.-Col. Mervyn O'Gorman, C.B., and the Secretary.

Election of Members.—The following New Members were elected:—Flying Officer Marion Hughes Aten, R.A.F.; Major John Bowley Quested, M.C.; Harry Tempest Vane, C.B.E.

House Committee.—Report of Meeting of House Committee held on 8th March, 1921, was received and adopted.

Financial Statement for the Year, 1920.—The Revenue Account and Balance Sheet for the year 1920 were submitted and passed.

Finance Committee.—Report of Meeting of Finance Committee held on 8th March, 1921, was received and adopted.

Racing Committee.—Report of Meeting of Racing Committee held on 9th March, 1921, was received and adopted.

Aviators' Certificates.—The following Aviators' Certificates were granted:—7912 Thomas Wight Campbell, 7913 Alan Samuel Butler.

Aeronaut's Certificate.—The following Aeronaut's Certificate was granted:—277 Frank Cave-Browne-Cave.

Airship Pilot's Certificate.—The following Airship Pilot's Certificate was granted:—67 Frank Cave-Browne-Cave.

## THE ROYAL AIR FORCE MEMORIAL FUND.

A Meeting of the Executive Committee of the above Fund was held at the offices of the Fund, 7, Iddesleigh House, Caxton Street, S.W.1, on the 10th inst., Lord Hugh Cecil in the Chair. The Members of the Committee present were:—Air Vice-Marshal Sir John Salmond, K.C.B.; Air Vice-Marshal A. V. Vyvyan, C.B., D.S.O.; Air Commodore H. R. M. Brooke-Popham, C.B.; Sir Charles McLeod; Dame Helen Gwynne-Vaughan; H. E. Perrin, Esq.; W. S. Field, Esq.

The lists of grants made since the previous Meeting on the 17th February amounting to £83 7s 8d. were approved.

The list of donations and subscriptions received since the same date was also presented, and includes, on this occasion, the sum of £22,300 6s. 9d., which consists of the balance of the Royal Air Force Aids Committee, and which, by a unanimous decision of the Committee of that organisation, is to be used for the benefit of officers and men and their dependents under the rules of this Fund, the grand total therefore being £22,513 11s. 9d.

A sub-committee was appointed to meet fortnightly to assist the Secretary to deal with all applications for assistance from the Fund, it being arranged that the Secretary might make grants, pending the meeting of the sub-committee, in urgent cases, but that grants that could reasonably be reserved for the sub-committee, should be so reserved. Mr. Perrin was appointed Chairman of this sub-committee, with Mr. Walter Field as a member, and a lady and an Air Force serving officer are to be added to the sub-committee.

It was decided to purchase a presentation at the Royal School for daughters of Officers of the Army, Bath, such presentation to cost £120, it being a necessity that the officer concerned should have served in the commissioned ranks of the Army prior to joining the R.F.C. or R.A.F.

The question of the concrete Memorial to the Officers and Men of the R.A.F. who fell in the Great War was discussed at length, and the Chairman reported that he was in close touch with Sir Aston Webb on the general question. Meantime, the suitability of the site at Whitehall Stairs, Thames Embankment, was considered, with special reference to structural adaptability, and the Secretary was directed to see the authorities of the London County Council to obtain the expert opinion of their engineer on this matter.

The work of renovation and preparation at Vanbrugh Castle to suit it for the purpose of a Boys' Home were reported by Sir John Salmond as proceeding satisfactorily.

The sale of the two houses at Ascot, presented to the Air Council by Mrs. M. E. Salting, has been fixed for the 19th April next, the proceeds, by the kindness of the Air Council, being devoted to the Fund, and to be used, at Mrs. Salting's request, for the provision of scholarships at approved schools for the children of officers.

The question of holding an Aerial Pageant in the north of England during the coming Summer was discussed but was adjourned until a future date.

The next meeting of the Fund was fixed for Thursday, 14th April, 1921, at the offices of the Fund at 3 p.m.

| | | | |
|---|---|---|---|
| Amount of donations and subscriptions announced up to the 16th February, 1921 ........ | £105,355 | 8 | 11 |
| Balance R.A.F. Aids Committee ........ | 22,300 | 6 | 9 |
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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... ... ... ... 263
Arrol-Johnston, Ltd. ... ... ... Front Cover
Auster, Ltd. ... ... ... ... ... Front Cover
Beardmore Aero Engines, Ltd., The Front Cover
Beardmore, William, & Co., Ltd. ... ... 257
Bray, Gibb & Co., Ltd. ... ... ... ... 266
Bristol Aeroplane Co., Ltd. ... ... ... 261
Burlington Publishing Co., Ltd., The... ... 266
Cunard Line ... ... ... ... ... ... 268
De Havilland Aircraft Co., Ltd., The... ... 259
Fairey Aviation Co., Ltd., The ... ... ... 247
Falcon Airscrew Co. ... ... ... ... 263
Firth, Thos., & Sons, Ltd. ... ... ... 261
Green Engine Co., Ltd. ... ... ... Back Cover
Handley Page, Ltd. ... ... ... ... 263
Imray, Laurie, Norie & Wilson, Ltd. ... ... 268
Instone Air Line ... ... ... ... 264
MacLennan, John, & Co.... ... ...Front Cover
Metal Airscrew Co., Ltd. ... ... .. Front Cover
Naylor Brothers (London), Ltd. ... ... 266
New Pegamoid, Ltd. ... ... ... ... 268
Nieuport and General Aircraft Co., Ltd. ... 259
Palmer Tyre, Ltd. ... ... ... ... ... 255
Roe, A. V., & Co., Ltd. ... ...Inside Front Cover
Rolls-Royce, Ltd. ... ... ... ... ... 249
Rubery, Owen & Co. ... ... ... ... 267
Supermarine Aviation Works, Ltd., The Back Cover
Titanine, Ltd. Front Cover & Inside Back Cover
Vickers, Ltd.... ... ... ... ... ... 252
Wireless Press, Ltd. ... ... ... ... 267

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# THE AEROPLANE

VOL. XX. No. 12.

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## ON THINGS AS THEY SEEM.

Returning to England after an absence of five weeks, during which one has been completely out of touch with whatever has been going on below the surface to produce the present apparent revival of Civil Aviation, one finds oneself very much in the position of an impartial observer, keenly interested in the subject of commercial flying but free from influences or prejudices on one side or the other and knowing only such facts as can be sifted out from the flummery which has appeared in the daily Press. Therefore one feels entitled to write on things as they seem rather than on things as they are.

### Bolstering Air Lines.

To the observer it appears that somehow or other the Department of Civil Aviation and the Treasury have been rushed by some influence or intrigue into spending public money on bolstering up so-called air lines between London and Paris when it has already been proved by the hard logic of facts that such lines cannot be made to pay their expenses—at any rate, with the types of machines which have been used or in the hands of the people who have used them. As apparently the same machines and the same people are concerned with the resuscitated lines one fails utterly to see what good purpose is served by spending public money in this way.

One does not for a moment blame the Air Ministry or the Department of Civil Aviation for their actions in this matter. One assumes that they have been forced to act thus by political agitation, judging by the extraordinarily silly, or perhaps one should say by the extraordinary number of ordinarily silly, speeches made on the subject of civil aviation during the recent debate on the Air Estimates.

Those officials of the Air Ministry who are concerned with Civil Aviation are irreproachably honest, they have very great experience of flying in all its aspects, and they have considerable common sense, amounting in some cases to wisdom. Yet they have been forced into doing an unwise thing, which will result in the maintenance of Civil Aviation at the expense of Commercial Aviation.

Subsidised Civil Aviation (consisting of a few aeroplanes flying between London and Paris at the expense of the Taxpayer) is no more like Commercial Aviation than Mr. Lloyd George is like a statesman. Opportunism can never compete with Honesty in the long run.

If Civil Aviation cannot exist as a commercial proposition, then there is no reason why it should exist at all. If we must have an air line between London and Paris—which is a subject quite open to debate—then there are only two reasonable alternatives; either it must be a commercial proposition operating on its own merits, or it must be a Government concern operated by a Government Department.

### An Inversion of Precedent.

The present arrangement, under which the Government buys obsolescent machines and allows private firms to operate them for the profit of those firms is a topsy-turvy scheme which is an inversion of all precedents. It is true that the Post Office does not own those familiar red vans which hurtle around London to the peril of the populace, nor does it operate them. But those vans are engaged under contract to do certain work at a certain price. Which is sound finance.

What would be said if the Post Office bought up a number of elderly motor vans and horse-carts and handed them over to defunct taxicab or char-à-bancs firms to run or crash the postal service at their own sweet will? Or what would be said if the Board of Trade bought up a quantity of rather less than more modern steamboats and allowed various and sundry steamship firms, which had already failed to run their own lines at a profit, to operate these boats for passenger and parcels traffic. The alleged "economy and efficiency" Press would be up in arms in a moment and the inimitable "Poy" and Mr. Tom Webster would have the time of ther lives.

### The Apparent Motive.

The truth seems to be—one does not say that it is so, but merely that it seems to be—that to keep the Harmsworth papers and those Members of Parliament who mistake the voice of those papers for the *vox populi* (which is truly the *vox dei* in the ears of our opportunist Government) from howling for the spending of R.A.F. money on Civil Aviation, the said opportunists, who are at least clever in their opportunism, have hit on the much cheaper scheme of buying a few machines, handing them over to defunct or comatose air lines, and saying: "Now, then, get along with it!"

That ought at least to keep the agitators quiet for a while, and ought to keep the flag of British Civil Aviation flying long enough to allow the Department of Civil Aviation time to get a properly sound commercial scheme going. Personally, one regards the machines which have been handed over for air-line work very much as the sleigh-drivers in the Russian stories of one's youth must have regarded the things which they threw overboard to distract the attention of the wolves while they and the more important contents of the sleigh escaped to a safer neighbourhood.

### A Matter of Common Sense.

One implies no disrespect for the respectable old Handley Pages, and the somewhat more modern "Vimy," and the still more modern D.H.18s. which are thus being sacrificed to popular clamour. They have all done good work in their time, and they have taught useful lessons, if the people who handled them have had the sense to learn. But they are not commercial aeroplanes, and therefore they are of no permanent use for Commercial Aviation.

Nobody knows it better than the people who built them. The Handley Page firm are building new types with the new H.P. wing. The De Havilland Company are going ahead with their big commercial monoplane with a high lift wing. One does not know what the Vickers people are doing, but one does not suppose that they are building any more standard "Vimys" for commercial work. All of which would not be happening if the machines which have been bought by the Air Ministry for the use of the Air Lines had been commercial propositions. Therefore why attempt to use for commercial aviation machines of types which their own makers admit are not commercial propositions?

Surely it would be more sensible to wait till the new commercial types are ready and then buy them for use on a Government service until such time as some real business man arises who has the common gumption to see that an air line properly run by business people on business lines is a commercial proposition.

### Those Conferences.

Certainly one has no belief whatever in the usefulness of the much advertised "conferences" which have been held between Lord Londonderry, Sir Frederick Sykes, and Sir James Stephenson, representing the Air Ministry, on the one hand, and representatives of the air transport firms on the other. They seem to be a mere waste of the time of useful and important Government officials. When one reads the list of names of people who are alleged to represent transport, practically all one sees is the names of people who have definitely made a failure of air transport. One does not see many names of people who have made a success of other methods of transport.

Even these air transport people themselves have little enough respect for or belief in one another. One of them refers to a rival concern as one "whose stock consists of dead wood and whose staff consists of dead-heads." Another describes a competitor as "buzzing round and round like a blue-bottle fly in a strange larder, bumping into everything and thinking what a Hell of a mileage he is putting up."

When that is the state of mind of the people most concerned, and when such descriptions can be applied with even a semblance of truth to people who have tried to run air transport, then it strikes one personally that it is sheer waste of time to hold the conferences.

### An Undeserved Jibe.

There is, however, also the point that if there are no British air lines then the £1,000,000 voted for the Department of

Civil Aviation is being spent for the benefit of foreigners. The jeer has already been thrown at the Department that it cost £10 to transport a passenger by air from London to Paris, and £50 to legislate him or regulate him across the Channel. That is, of course, purely a fallacy, very amusing at a joke, but quite unsound as an argument. One might just as well argue that a police force is cheaper when there are many crimes than when there are few: as, for example, if a police force costs £1,000,000 to run and there are a million criminals then each criminal only cost £1 to police, whereas if there are only 100 criminals each costs £10,000, and so the police force is very expensive, the truth being that the fewer the criminals the better the police force.

Proper regulation of Civil Aviation is necessary. Which is proved by the laments from Australia, South Africa, and elsewhere that accidents occur because any old pilot can fly and crash any old machine and kill any number of passengers because there are no rules and regulations to stop him. Therefore, if there were no British aeroplanes at all the Department of Civil Aviation would still be necessary, and perhaps more necessary than ever, to prevent bad foreign pilots with bad foreign aeroplanes from coming over here and immolating our ignorant populace who would be tempted to go a-flying with them.

### A Remote Hope.

Howbeit, there are the conferences and there is the decision that obsolescent machines shall be bought with our perfectly good money to be run experimentally (after two years of unfortunate experience) as representing British Civil Aviation. The experiment will be watched with interest.

The best for which one can hope is that it may be sufficiently far from a failure to tempt a few people with experience of transport organisation to come in and organise air transport on a big and adequately financed scale. Something, for example, like the £1,000,000 scheme which was put up to the Air Ministry by Mr. Holt Thomas, a scheme which was adequately guaranteed and would be directed by really big business interests, might thus be brought into being.

### Words of Wisdom.

In the meantime one strongly recommends everybody who is interested in any way in air transport to read and/or re-read "Strasbourg's" article on page 229 of THE AEROPLANE of March 9th. It sets forth far better than one could possibly do oneself the hideous folly advocated by the Harmsworth Press of robbing the militant side of the R.A.F., which is most efficiently run by experienced Service people, in order to provide subsidies for air lines to be run by people without experience of transport organisation.

Also it exposes the foolishness of the idea that a commercial air fleet can provide a war fleet in time of need. And it proves the fallacy of the idea that British commercial aviation cannot exist in the face of French competition, unless subsidised on equal terms.

Furthermore, one would draw attention to Captain W. H. Sayers' cutting remark, on page 236, of the same issue, that "it is very nearly time that someone speaking with what will pass with the public for authority announces the truth that commercial aviation has not paid so far because practically every effort made to operate air lines has been directed by those who know nothing about the economics of transportation, and, judging by some of their statements, precious little about aviation."

Those who desire to acquire a sound, if elementary, idea of the working principles of transportation and their application to air transport are also strongly recommended to read Captain Sayers' article on "Aerial Transport in the Light of History" on page 253 of THE AEROPLANE of March 16th. Captain Sayers had intimate experience of electric transport long before the days of aeroplanes, and in that article he applies his experience to our present problems. If his views were studied intelligently and put into operation by sensible people we should hear less about the need for subsidies or for State aid and should soon be hearing of something like a little boom in aviation.

As he puts it so clearly, "the value of rapid transport is no direct function of speed *per se*, but of the time which can be saved by the use of high speed." As Mr. Kipling said in "With the Night Mail": "Transportation is Civilisation." But this is only true when Transportation is intelligently and efficiently operated by competent people. It remains to be seen whether those who are now being assisted by our—the taxpayers'—money to resuscitate dead or comatose air lines are competent to apply the elementary laws of transportation either intelligently or efficiently.

At any rate, one can with a clear conscience compliment the Air Council and the various departments of the Air Ministry on having done at the least possible expense the best that could be done under the conditions forced upon them. If the present scheme fails, it will not be the fault of the Air Ministry, and it will not have cost very much.—C. G. G.

## THE RESURRECTION OF BRITISH AIR LINES.

### The London-Paris Air Service.

As the result of the Committee set up by Mr. Winston Churchill, M.P., to consider the problems of Civil Aviation, more directly concerned with the Continental services, it was definitely decided to run a temporary service, which, however, will cease to operate as soon as a more permanent scheme, which is now under consideration, is inaugurated.

With regard to statements that appeared in a certain daily news-sheet concerning an offer of £1,000,000 guaranteed capital to run a service to Paris, the Marquis of Londonderry authorised the Air Ministry to state that he had received no offer to form a company with £1,000,000 capital, already guaranteed, to conduct air services to the Continent. It appears that a company, with a capital of £1,000,000 sterling, for conducting a cross-Channel air service, was proposed to the Air Ministry by Mr. Holt Thomas, the British, Foreign and Colonial Corporation having agreed to find capital without remuneration provided that the company was conducted on really national lines.

The Air Ministry's statement that no such proposition was before them seems technically correct, as the offer was withdrawn owing to the intimation that measures would be taken for a temporary service, which it was considered might endanger the successful formation of the new company.

At the same time one has the best possible authority for stating definitely that the offer was actually made and that reliable guarantees were forthcoming for the £1,000,000 mentioned. Such an arrangement would obviously be preferable to the present hotch-potch.—C. G. G.

### OPERATIONS BEGIN.

On March 17th the Air Ministry made the following announcement:—

"The Committee recently appointed by the Secretary of State for Air to investigate the question of Cross-Channel Air Services has now been able to make arrangements for a daily British Air Service between London (Croydon) and Paris. This service will be started on Monday, 21st inst., by Messrs. Instone, Ltd., and Messrs. Handley Page, Ltd.

"This arrangement is purely temporary and will cease to be in force so soon as a more permanent scheme, now under consideration, is inaugurated."

There has apparently been an arrangement between the Air Ministry, the Instone Air Line, and Handley Page Transport to revive the Paris Air Service and later on that to Brussels, Amsterdam, and possibly also other routes.

The single fare from London to Paris will be six guineas, and the return fare £12. In addition to passengers, goods will be carried at 1s. per lb. for 100 lb. and 10d. for each lb. in excess of that quantity. The contract with the French firms for the carriage of mails was a temporary one, and no technical difficulties will be met in handing the mails back to the British firms.

The form of subsidy approved by the Air Ministry will be based on flights carried out, and payment will be made not in a specified sum for each completed flight but as an insurance that flights are not made at a loss, and therefore may vary considerably with the circumstances.

The Handley Page Service will for the moment operate o/400 type machines until such time as the new type machines which, one understands, are now in the construction stage, are ready. The Instone Air Line will operate the "Vimy," 3 D.H.18s and the Napier-Westland. The "Vimy" is of course the "City of London," the two D.H.18s (G-EAUF and G-EARO) have been purchased by the Air Ministry, hired out to the I.A.L. and have been christened the "City of Paris" and the "City of Cardiff" (the D.H.4a, which held the latter name, being re-christened the "City of York"). A new D.H.18 to be named the "City of Brussels" is being obtained from the De Havilland Aircraft Company and will be ready for delivery in about a fortnight.

The Napier-Westland, the "City of Yeovil," one believes is its name, should be in the hands of the I.A.L. by the time these lines appear in print.

On Saturday last Handley Page Transport forestalled their competitors by sending off to Paris from Cricklewood, without any re-inauguration ceremony, an o/400 piloted by Mr. Hope. One learns that in future they will operate from Croydon and will occupy the half of the double shed previously used by A.T. and T.

The Instone Line inaugurated their service on Monday, Mr. Barnard taking the "Vimy" off with seven passengers at 12.35. Mr. Powell, the "18" pilot of A.T. and T. fame, who later joined the Air Post of Banks, has now joined the I.A.L. as extra pilot and it is good to see their old mechanics back again and strongly reinforced by erstwhile A.T. and T. men.

Lord Londonderry accompanied by Col. Beatty and Gen. Festing and others were present to see the machine start,

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as also were Messrs. Samuel and Theodore Instone and Capt. Alfred Instone, three of the directors of the line.

Afterwards the directors entertained the visitors and the aerodrome staff to a lunch (excellently served by Mrs. Middleton, of Trust Houses Ltd.) at which they briefly explained the policy of the line.

One wishes the new order of things every success, and especially does this apply to Messrs. Barnard and Chattaway, who have worked so hard throughout the dark days. It seems a great pity, however, that the organisation and personnel of the late Aircraft Transport and Travel, Ltd., could not somehow or other have been worked into the new state of affairs, for up to date they are the people who have gained the most knowledge and have done most to forward British Civil Aviation.—G. D.

## THE AIR ESTIMATES—IV.

At the conclusion of the Debate on March 1st, the House went into Committee on the Air Estimates. On the question being proposed as to the maintenance of 30,880, all ranks, in the Air Force, Mr. Bonar Law said that in view of the undesirability of going through the remaining stages of the Estimates in the absence of the responsible Minister he would undertake—if the House would give the Government Vote A and Vote 1 that evening—to give a day for the complete discussion of Vote 1 as soon as possible after Mr. Churchill's return.

Sir Donald Maclean, once again dwelling on the dual existence of Mr. Churchill, agreed and suggested that when some such vote as Vote V (Air Ministry) was taken general observations by members could then be heard by the Committee.

On the question under discussion Major-General Seely, Lieut.-Col. Ward, Mr. Stephen Walsh, Sir W. Joynson Hicks, and Lieut.-Comdr. Kenworthy all spoke. Lieut.-Col. Ward, ever frank in his expression of his views, alone among honourable members was strongly in favour of the present system of allowing one Minister to control the Air Ministry in addition to another Department of State.

After a brief Report stage on March 2nd proceedings were deferred until the return of the Secretary of State for Air from Egypt.

## THE BRITISH MISSION TO JAPAN.

Owing to the refusal of the British Government to permit a regular R.A.F. Mission to go to Japan to train the Japanese Naval Air Services an unofficial mission has been formed and most of the members thereof are now on their way across the United States or are on the Pacific *en route* for Japan.

The organiser and commanding officer is Colonel the Master of Sempill, who is probably as well known in and knows as much of the United States as any R.A.F. officer. His second in command is Major Bernard Fowler, who has been flying since 1910, and founded the Eastbourne Aviation Co., Ltd., and the Eastbourne Aerodrome. Major Fowler is O.C. all flying operation and instruction, and he is known here as one of the best instructors in the R.A.F.

The O.C. ground organisation, as opposite number to Major Fowler on the Flying side, is Lieut.-Col. Mears, who did excellent organising work in the R.A.F. during the war. Furthermore Col. Mears knows the Far East intimately, and probably knows the road from Pekin to India as well as does Sir Frederick Sykes. Though China and Thibet have little at present to do with Japan one never knows when Col. Mears' experiences of the Oriental and his ways may come in useful either to his new employers, or to the British Mission when war with America draws near.

With these officers are a number of highly skilled pilots and engineers, as well as mechanics, so that it should be capable of doing excellent work, and should build up a very nice little Naval Air Service for Japan, before the outbreak of war, always provided that enough Japanese can learn how to fly, which is the great difficulty at the moment. However, if the Japanese do not make good pilots they can always equip their Air Service with inherently stable aeroplanes and with automatic control gadgets.

Doubtless the United States will not be pleased with us for sending this Mission to Japan, but let all good Americans remember that they themselves have barred us from selling aeroplanes in the United States, and that we must sell our products, human and mechanical, where we are allowed to do so. And, even if we do sell our knowledge of aviation and our aeroplanes to Japan, the fact will always remain that when the war comes the Americans will have our sympathy and moral support which will cost them nothing—except perhaps the cancellation of our War Debt to the United States.—C. G. G.

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# NAVAL AND MILITARY AERONAUTICS.

## GREAT BRITAIN.

### Memorial Service to H.M. Submarine K5.

On Sunday, March 20th, at 4 p.m., the Atlantic Fleet, homeward bound from Spain, stopped in Lat. 48.51 N., Long. 09.05 W., a position about 150 miles S.W. from Land's End, in order to pay a last tribute to the officers and men of H.M. Submarine K5, lost during manœuvres on Jan. 20th last.

According to a message transmitted by the Vice-Admiral commanding the 1st Battle Squadron, the day was bright with a strong N.W. wind and long ocean swell which caused wet decks and a heavy rolling, even in battleships and battle-cruisers. In spite of the difficult flying conditions the participation of a detachment of the R.A.F. in the Fleet was manifested by an aeroplane from H.M.S. *Argus*, which circled round the Fleet during the service.

### Jutland Prize Bounty.

In Naval orders issued on March 17th appeared a list of 151 of H.M. ships to which the award of Prize Bounty for the Battle of Jutland was made. H.M.S. *Engadine*, the only aircraft-carrier in the action, which had the honour of sending up the only seaplane during the battle, is entitled to participate in the award.

To her credit lies the fact that she successfully towed H.M.S. *Warrior* out of action.

It would be interesting to know whether the Germans have made a similar award for what they claimed as their victory.

### The Second Cattewater Reunion Dinner.

The Cattewater (R.A.F. Seaplane Base) Old Boys' Club are holding their second reunion dinner on April 2nd (Saturday) at 6.30 p.m., at the Midland Grand Hotel, St. Pancras.

Tickets can be obtained of hon. sec., Mr. H. F. Bosher, 158, High Road, East Finchley, London, N.2.

## BELGIUM.

### The King and Queen of the Belgians as Military Aviators.

The King and Queen of the Belgians have informed the Commandant of the Belgian Aeronautique Militaire that they have agreed to accept the honorary rank of military aviator. The presentation of the flying insignia to their Majesties will take place some time during this month.

## BRAZIL.

### Army N.C.O. Instructors.

Under the existing regulations of the Brazilian Army it is laid down that the post of instructor at the Military School of Aviation shall be confined to commissioned officers.

Col. Magnin, Technical Chief of the French Military Mission to Brazil, has proposed to the Minister of War, in view of the excellent results of the training course for N.C.Os., and the capacity shown by some of the pupils, that in future N.C.O. pilots be employed as assistant instructors.

This proposal was adopted and an official decree to that effect was signed by the President of the Republic on Oct. 27th, 1920.

### Aerial Police Force School.

The creation of a school of aviation for the police forces of the State of Minas Gerdes has now been sanctioned, and a preliminary credit of 150 contos of reis has been made for the purpose.

### Naval Flying School Moved.

The Brazilian Naval School of Flying, at present situated at the Ilha das Enxadas, near Rio, is likely to be removed to the Ilha do Governador, in the same vicinity, as the latter island offers more space and greater facilities for the purpose.

## DUTCH EAST INDIES.

### Army Aviation.

According to the "Fortnightly Commercial Review of the Dutch East Indian Archipelago," the new organisation of the Army Aviation Service provides for two groups of three squadrons of six aeroplanes each

On Nov. 13th Capt. Leendertz, of the Army Aviation Service, made a flight lasting 5½ hours, the longest on record for Java. Starting from Bandung, he flew to Tjilatjap on the south coast, and from there to Tegal on the north coast, thence westward to Cheribon, and then back again to Bandung, without stopping once.

## FRANCE.

### French Interests Abroad.

French Air Attachés will shortly be appointed in London, Rome, Madrid, Bukarest, Tokio, Pekin and Buenos Aires.

## JAPAN.

A Japanese correspondent of THE AEROPLANE writes :—

### Arrival of Some of Japan's Share of German Aircraft.

Thirty of German aeroplanes, part of Japan's share of the machines captured during the war, recently arrived at Yokohama, and one Zeppelin airship for the Navy is expected to arrive some time in the next month or later.

The aeroplanes will be delivered to the Japanese aviation authorities in the presence of the Military Attaché of the French Embassy. It is proposed to keep them at the Army Flying School, in the Aviation Section of the Tokio Imperial University, and at the Army Arsenal.

The best of them will be rebuilt and used for training purposes.

### A Military Looping Record.

On Sept. 13th Capt. Oseki, of the Army Flying Corps, on a Sopwith biplane (130-h.p. Clerget, single seat), beat the Japanese looping record by looping 35 times above Tokio.

### A Good Performance.

A remarkable record at shooting down balloons from an aeroplane has been established by Lieut. Higuchi, an instructor in Army Flying School at Akenohara aerodrome, in Aichi Prefecture. He went up in a Nieuport biplane and made a record of 48 per cent. The highest record made in France some time ago was 35 per cent.—N. K.

## MEXICO.

### New Mexican Air Chief.

Senor Rafael A. O'Neill has recently been appointed the Chief of the Mexican National Air Service. It is reported in *Aviation* for Jan. 3rd that he was then in England purchasing machines for the formation of several squadrons, as well as spares and field and school equipment. Senor Rafael Ponce de Leon has been appointed his Chief of Staff, whose assistants are Pilot Officers Alfonso Virgen, Rafael Montero, Samuel C. Rojas, Guillermo Ponce de Leon and Ascencio Jimenz.

## PERU.

### Naval Aviation.

Great enthusiasm is being shown in Peru in organising the Naval Air Service. A full staff of pilots and ground engineers have been secured from the U.S. Naval Air Service under contract with the Peruvian Government. The pilots in charge of the instruction are B. Ruswebben and W. Wheeler, to whom the rank of flight lieut. have been given. Capt. J. Leguia, the son of the Peruvian President, A. B. Leguia, is in charge of the organisation of the Service.

Nine Curtiss "Seagulls" (150-h.p. Curtiss) have been delivered to the naval seaplane station at Ancon, near Callao, and it is hoped that by April thirty flying-boats will be in service. A large number of cadets have already been enrolled.

A surveying party is visiting various ports with the hope of establishing six seaplane stations as well as aerodromes with a view to establishing an aerial route to link up the whole of the Peruvian coast.

### Military Aviation.

The first ten 110-h.p. Le Rhone-Avros for the Peruvian Air Force were recently delivered by Major Sison, who has been lent by the R.A.F. to the Peruvian Government. These machines will be used for instructional purposes Major Sison took up the first Avro and demonstrated its flying qualities before the Minister of War, Col. Castro, and his staff.

During another visit of the Minister of War a flying display was given by Major Sison on an Avro, Major Goudouret on a Morane monoplane, Lieut. Romanet on a Salmson, and Lieut. Pootzel on a Caudron. During the demonstration Major Sison made a remarkable forced landing in a small field, due to engine trouble, side-slipping at an angle of 45 deg. and landing without damage.—H. G.-C.

## POLAND.

At the second Armistice Night Dinner given at the Hotel Astor, New York, by the American Flying Services, Lieut.-Col. Cedric E. Fauntleroy, Commander of the Polish Air Force, Southern Front, who was a guest of honour, disclosed some rather interesting details dealing with the operations of the Polish Air Forces acting against the Bolshevists.

Col. Fauntleroy made public a message from the Polish people, who felt that, unless Bolshevism falls early in the spring of this year, Poland will be overrun and all Europe laid open to the peril of radicalism.

While that is rather a sweeping statement, it is fairly obvious that, with the fall of General Wrangel in South Russia, Poland will most certainly be the sole object of attack next year with considerably strengthened Red Forces. This alone is sufficient to lay stress on Poland's needs for a strong Air Service The Reds implant their doctrine successfully where there is famine, and Poland is starving. The Red armies in their attack on Poland have been made up chiefly of cavalry, and the Polish Air Service is credited with having stopped the advance of these forces.

Col. Fauntleroy for the first time told the story of America's participation in Poland's struggle for independence. Of the original members who joined up at the end of the European war only three remain, and Col. Fauntleroy was then in America recruiting for further volunteers.

He was in command of the Southern Forces, which extend from Pinsk to the Roumanian frontier, and he has never had more than 80 men or 25 machines, of which, except on rare occasions, no more than 10 have been in condition at one time.

The equipment is of a very variegated type and is such as could be obtained from French and late enemy surplus. Their work was ground harassment and bombing, and they operated generally from 15 to 75 feet from the ground.

Many of the pilots operated singly. Capt. G. M. Crawford, while flying south of Kieff, saw six boatloads of troops crossing a river. All the incendiary ammunition in the Polish army—but 500 rounds—was in his machine. He dived and fired into the biggest boat, literally black with troops, which was fired and sunk, the troops being thrown into the river. Two days later Capt. Crawford attacked a Red army numbering 35,000 whilst on parade for inspection. He began firing at 75 ft. and 80 men and 120 horses were counted as being slain.

Col. Fauntleroy's squadron was on the front from March 10th—Sept. 22nd, 1920, and in that time they operated from 27 different aerodromes The Red army was attacked on May 1st and 2nd and on June 29th and 30th, and four retreats were forced. At Lemberg the Red army was attacked with 18 machines, of which 13 were different types. In two days 126 raids were made, 85,000 kilos of bombs were dropped and 58,000 rounds of ammunition discharged. From Aug. 1st. to Sept. 15th they made 398 flights, shooting 168,000 rounds and dropping 35,000 kilos of bombs.

This good work has earned considerable praise from the General Commanding the Southern Forces, who sent a dispatch to the Chief of Staff asking for the substitution of 100 aeroplanes for all infantry on the front, stating that with aircraft he would be able to stop the Bolshevist advance. The Chief of Staff agreed, but was unable to supply the aircraft. But even with what was available, under the command of Col. Fauntleroy, Red advances were stopped, confirmation of which was obtained by intelligence officers from the commander of the enemy forces himself.

Col. Fauntleroy said that it is only just to the squadron to say that Poland gives to its Air Service the credit for saving the country. If the Red advance in the north had been duplicated in the south it would have meant the fall of the Republic.

## UNITED STATES OF AMERICA.

### U.S. Naval Developments in 1920.

The annual report of the Secretary of the Navy contains many references to aircraft, many of which are given hereafter, and which demonstrate the large amount of practical work that has been carried out since the cessation of hostilities.

Following on the U.S. Navy's well-organised Atlantic Flight with the N.C. type of boat, a squadron of six F.5.Ls. carried out a seven-months' training cruise, starting from Philadelphia and embracing the West Indies and the Spanish Main generally, covering in all 12,731 miles, without a serious mishap or loss of life! The squadron was accompanied by U.S.S.'s *Shawmut* and *Sandpiper,* acting as mother ship and repair and fuel ship respectively. It was found unnecessary to house the machines, and repairs which necessitated hauling the machines out of water were few and far between, all minor repairs being carried out by the crews of the various craft. Throughout the flight the F.5.Ls. carried out fleet tactical exercises.

During the year, in spite of the post-war readjustments and reduction in personnel, approximately 1,570,892 miles were covered by the Marine Corps and Naval aircraft.

The N.C.4, which made the first flight across the Atlantic, made a trip down the Atlantic and Gulf of Orleans coasts and up the Mississippi River in the interests of recruiting, covering 5,822 miles with very satisfactory results.

Two divisions of N.C. boats with U.S. destroyers *Harding* and *Mugford* as tenders have been attached to the Atlantic and Pacific Fleets respectively.

A bombing unit has been established at Hampton Roads pending the commissioning of the U.S.S. *Langley,* an aircraft-carrier converted from the Naval Collier *Jupiter.* Similarly, a B-type Shipping Board vessel has been converted into an aircraft-carrier and renamed *Wright.*

Four battleships of the Atlantic Fleet have been fitted with two flying-off platforms on the superimposed fore and aft turrets in a manner similar to that employed on all British capital ships during the late war.

In addition to taking delivery of the R.38 now being constructed at Cardington, near Bedford, some time this year, the construction of a large rigid airship will be undertaken in the States under the supervision of the Navy Department, who have been charged with the development of rigid airships in the United States.

A large rigid hangar is nearing completion at Lakehurst, N.J., which when completed will be the largest in the world. It will accommodate two airships, and will be used for the erection and housing of rigids. A further shed is being erected at Cape May, N.J., and as soon as land can be acquired on the west coast a large double hangar will be erected there with the funds already appropriated for the purpose.

In the meantime, non-rigids are being used for training purposes, and during the year some 1,723 flights, with a total mileage of 135,525, have been successfully carried out. Exercises with kite-balloons in connection with ships have been pursued successfully.

Early in the winter of 1919 the U.S. Naval air station at San Diego, Cal., established an experimental fish patrol in conjunction with the local fisheries, and in the summer of 1920 further experiments were made in Hampton Roads, both experiments yielding excellent results. The success being guaranteed, the Navy will discontinue this activity, leaving it to the development by commercial enterprise.

The Navy Department has undertaken, at the Naval Aircraft Factory at Philadelphia, the construction of a huge flying-boat. This machine is a development of the N.C. type and will weigh roughly 60,000 lb., with metal-wing structures, and a combination of nine "Liberty" engines arranged in three groups.

An aeroplane cannon is being developed, and six guns are completed. After further tests and minor modifications in the firing mechanism these guns will be issued to the Service as a part of the armament of the N.C. type of boat.

The Navy is maintaining only such air stations as are necessary from an operation standpoint and on July 1st, 1920, these were: Rockaway, L.I.; Hampton Roads, Va.; Anacostia, D.C.; Parris Island, S.C.; Pensacola, Fa.; San Diego, Cal.; Inantico, Va.; Coco Solo, Canal Zone; Port au Prince, Haiti; Santo Domingo, Dominican Republic; and Pearl Harbour, Hawaii.

The number of enlisted men employed in Naval aviation duties on June 30th, 1920, was 7,000.

* * *

## ON A RETURN TO THE AIR.

By "BUNCH-COMMANDER."

There is a question frequently asked by pilots of one another, "Suppose I have not flown for some months, what shall I feel like on starting again?" Now everyone knows that even one's own machine feels to be all wrong if one has been away on leave or for some other reason one has not flown for a week or two.

The supposition is therefore that after a considerable lapse one would most probably have altogether lost one's whole touch.

One's own personal experience has been the very reverse of this. After staying on the ground for about two and a half years the present writer was given a chance of again "crashing into the atmosphere and juggling with death."

During the period of non-flying one had made many flights of fancy. In fact at one time one might have been seen while travelling trying to induce railway trains to leave the ground, using one's walking stick as joy-stick.

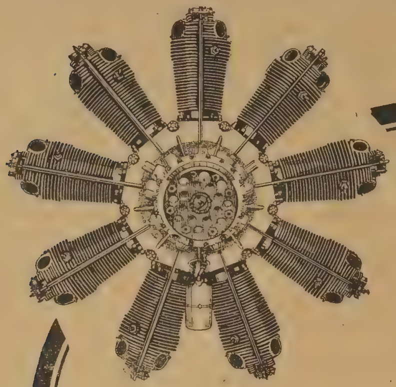
Further, one decided that, on leaving the ground, one would do no more than gentle turns until a height of at least 3,000 feet was obtained. Through the kindness of an old friend and his touching confidence in one's ability as a pilot (other people call this his utter ignorance and lack of all common sense), one was able to get hold of a fairly modern high-powered scout.

The first act was to chock it up into flying position and sit in it and observe how it felt, so that one might tell at once when it was in flying position when in the air. This is always a useful tip to remember when trying any new type of machine. One learnt this in the very early days of the war, if one's memory is correct, from watching Capt. (now Air Commodore) Longcroft flying the late Mr. Gustav Hamel's Morane.

During one's period of enforced inactivity on the ground one had made a fairly close study of Capt. Barber's "Aerobatics" and a thought that kept striking one on trying various evolutions was, "Good Heavens! old Barber is right after all!"

Not that one has ever had any reason to doubt Capt. Barber's veracity, but there is always a feeling of semi-surprise to some people (oneself included) on noticing even the obvious to be true. As witness the late Major McCudden's surprise during a scrap with a Hun machine to notice there was a man in it.

However, to revert, after about 20 minutes in the air one of the best landings in one's flying career was made, probably owing to the fact that extra care was taken.



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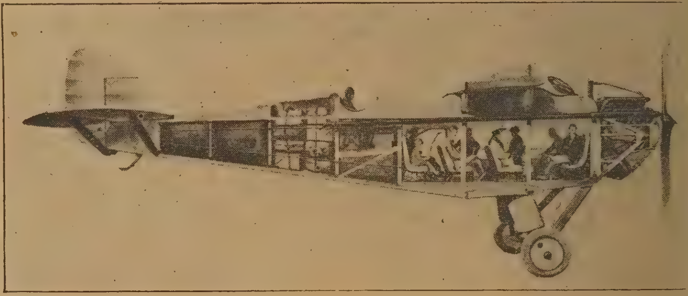

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## THE WEEKLY COMMENTARY.

A brief report of a lecture on Flying-boat Construction, by Mr. David Nicholson, and of the discussion thereon at the Royal Aeronautical Society appears below.

---

The Vickers Ambulance—a "Vimy" Commercial adapted to the purposes of the transport of sick or wounded—appears in this issue. Ambulance aeroplanes have been constructed by other countries, but none so completely equipped as is this has yet been described.

A paper on the Structural Design of Aircraft read before the Institution of Aeronautical Engineers by Dr. A. P. Thurston is reported on page 284. Both paper and discussion were of a distinctly practical nature.

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A very curious French helicopter is illustrated and described on page 282.

## FLYING-BOAT CONSTRUCTION.

A paper dealing with the construction of flying-boat hulls was read before the Royal Aeronautical Society by Mr. David Nicholson, A.M.I.N.A., on the afternoon of Thursday, March 17th. Very largely the paper was an appeal for the application to flying-boat hull construction of the proved principles of naval architecture, and in particular an appeal for the use of longitudinal framing rather than transverse framing. Particulars of many types of hull were given, illustrated by lantern slides, and their good and bad qualities were discussed.

Particularly the F-type hulls were severely criticised, a criticism doubtless well enough founded, though it has to be remembered that these hulls were developed in face of the incredulity of nearly all naval authorities by men who were far from being naval architects.

The P5 and N4 types, due to the late Major Linton Hope, were treated with greater respect, and the Beardmore WB-IX hull, largely built of duralumin, is regarded as a promising effort.

The Supermarine hulls, which are largely based on Linton Hope practice, were mentioned with commendation.

Finally a glossary of terms used in naval architecture, intended to aid the aircraft designer to understand the speech of the naval architect, was appended to the paper.

### The Discussion.

**Wing-Commander T. R. Cave-Brown-Cave** said that he was not qualified to discuss flying-boats technically, but he was interested in them. He wished to know if bulkheads in flying-boats could be relied on to stand up against a rush of water when the boat was at high speed. Also he would like to know if there was any recognised criterion of structural strength, such as sand-loading for the aeroplane, by which different types of structure could be compared. It certainly seemed obvious that the hull designer who departed widely from boat-building practice without very good reason was going to have difficulty in justifying that departure unless there were some such recognised test. If there were ever to be any very big aeroplanes he thought it certain they would be boats. Could Mr. Nicholson give them any information about size limits? What were the difficulties with large hulls, and were large boats going to remain timber, or would steel-ship methods come into use?

**Mr. W. O. Manning** said that the discussion of boat-hull design by naval architects was of great value. There was no room for doubt that the resilient type hull, due to a naval architect (the late Major Linton Hope), was the most satisfactory type yet evolved. With this type of hull certain problems not present in the land type of aircraft arose from the necessity of building onto a non-rigid structure a rigid wing system. The trouble arose from the fact that just that part of the hull which most needed to pant was made more or less rigid by the wing roots and their stays. Similar difficulties arose in regard to other fittings which had to be attached to the hull. Bulkheads were necessary, but it was doubtful if it was possible to construct one that would stand the rush of water if a boat holed at speed on the water.

**Commander Lands (U.S.N.)** said that flying-boat hulls were a big problem, and he thought the author was to be congratulated on his pluck in attacking the subject. His criticisms were constructive and therefore welcome. He thought the suggested drafting of Rules proposed should be considered seriously. Bulkheads were very serious and very difficult affairs. Expansion joints were heavy and probably impracticable, but a corrugated diaphram might be of use. He thought much could be learnt from destroyer and submarine practice, and probably the ultimate form arrived at would be a compromise.

**Mr. Hubert Scott Paine** (Supermarine Aviation Co., Ltd.) said that he had been building boats since 1910, and was just realising that he knew nothing about them. They had learnt a lot from the extraordinary distortion of racing motor-boats, where rigid bulkheads invariably lead to trouble. For a bulkhead to be useful it must be flexible in all directions. For the Martlesham trials bulkheads were called for and had to be fitted. They had spent a large amount of time and trouble to devise a satisfactory one, and thought they had succeeded. The competition machine had three, weighing 60 lb., and as they were never tested at the trials they might as well have fitted lighter ones. They had tested theirs by fitting them to a barrel with a 60-ft. stand-pipe and a water-tank and valve, and the rush on opening the valve defeated their six first designs.

**Mr. Gibson Knight** thought the proposed committee of naval architects to draw up rules for boat construction would find the time not yet ripe for their labours, and aircraft designers would be needed to sit with them. He was curious to know why the Supermarine hull was treated as a separate type by the author. It seemed to him to be of the P5 and N4 type.

**Capt. Sayers** thought that there was a disposition on the part of naval architects to give the designers of the F-boats less credit than was due. It might be admitted that the F-boat hulls were very crude. But the designers had produced, without any assistance, and with some considerable derision from naval architects, a flying-boat which got off, flew, and alighted, at a time when only one architect-designed hull, and that of a very special type, had ever taken the air. Due credit should be given them for providing the naval architect with data upon which to work.

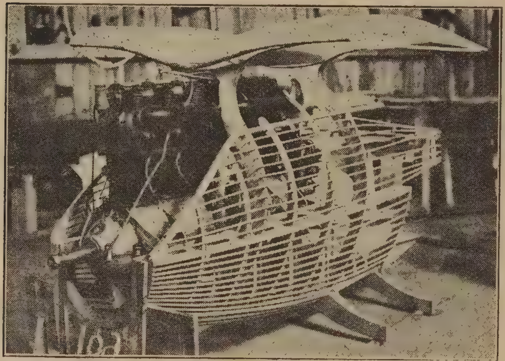
**Major A. R. Low** (Chairman), before calling upon the author to reply, said that the question of size was bound up with the theory of aeroplane dimensions. The actual hull could be built of any size, but the aeroplane structure imposed definite limits for any given type of construction, excellence of structural design, strength of materials, factor of safety, and aerodynamical qualities. Given present materials, the present standard of design and knowledge of aerodynamic qualities, we were now fairly close to the limit.

### The Reply.

In reply, **Mr. Nicholson** said that practically every speaker had mentioned bulkheads, which showed the importance of the subject, and a committee ought to be appointed to consider the question. Such committees did arrive at useful results in shipbuilding problems. Aircraft designers should not attack shipbuilding problems without consulting naval architects who had vast experience behind them. The choice of type of construction should obviously be settled in accord with the uses to be made of the finished craft. Hulls more than 60 ft. long undoubtedly should be steel. Under that length metal was not worth the trouble. As to size, the bigger the hull the better from the naval architect's point of view. Co-operation between aircraft designers and naval architects was essential. America had already started this, and so had Germany.

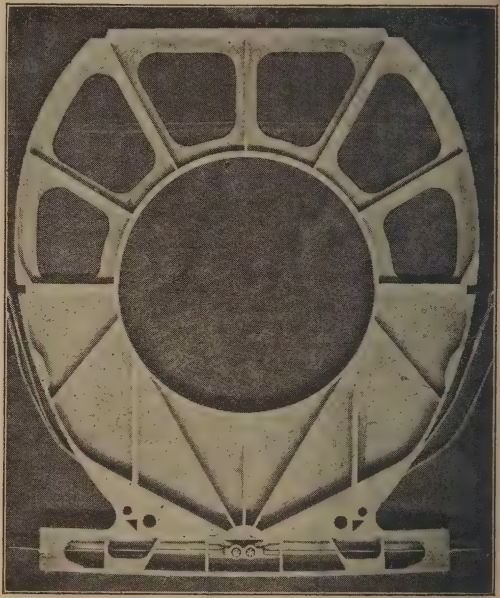
## A BOAT-BUILT FUSELAGE.

The two photographs here reproduced, though they have nothing to do with flying-boats, would doubtless please the naval architect much more than do certain flying-boat hulls. They represent some of the details of construction of the Rumpler boat-built fuselages for war aeroplanes. The photograph of the fore-end skeleton shows the construction generally as of transverse frames supported by through-going stringers, onto which the skin is afterwards applied.

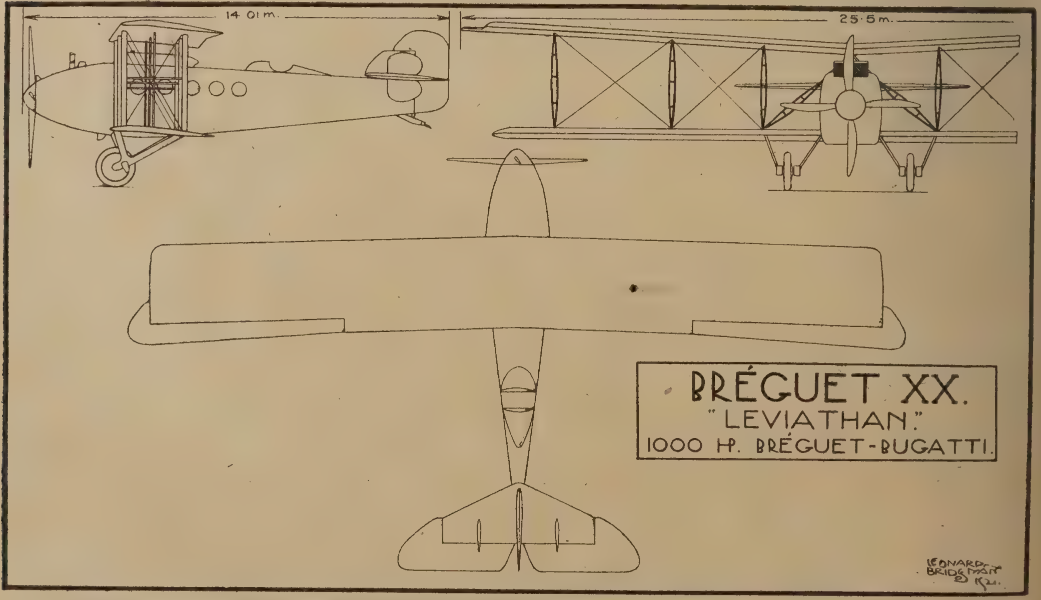


Fore end of a Rumpler boat-built fuselage, with centre section in place.

The photograph showing details of one main transverse frame is interesting as showing the very sound method of bringing both lift wires to a single central fitting, and also the provision of a direct tension member of steel to take the tension of the lower wings to the same fitting.



One main bulkhead of a Rumpler fuselage with wing root spars and lift wire attachment.



Scale Drawings of the Bréguet Leviathan, described in "Aeronautical Engineering" for Feb. 16th, 1921.

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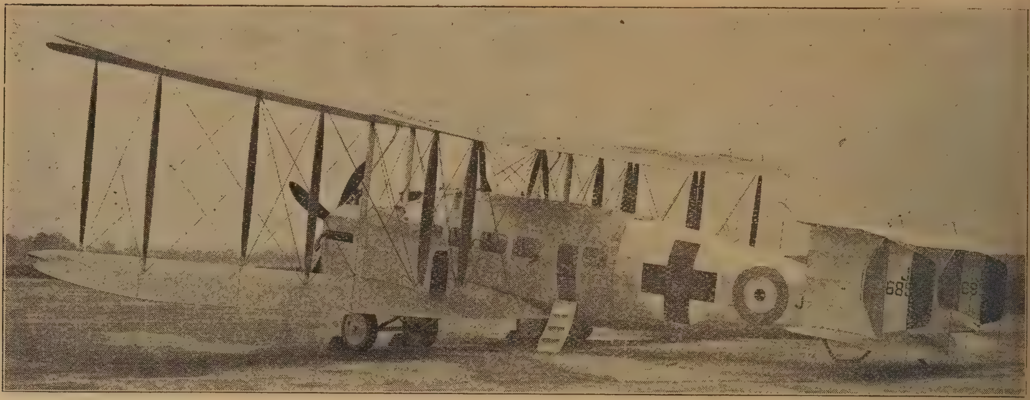
# THE VIMY AMBULANCE.



The Vickers Vimy Ambulance, fitted with two Napier 450-h.p. engines.

The Vickers flying ambulance, which has just been completed at Weybridge, is, as can be seen from the attached illustrations, an adaptation of the "Vimy" commercial. In so far as the aeroplane itself is concerned, the only important difference between this version and the standard passenger carrier consists in the use of two Napier "Lion" engines of 450 h.p. each in place of the Rolls "Eagles" of 360 h.p. which have previously been fitted. The following brief details of the general construction of the machine may, however, be of interest.

### Wings.

The spars are of box section of spruce and 3-ply wood bound with fabric; the interplane struts are of hollow spruce, except in the engine bay, where the struts are of round steel tube, reinforced where necessary, and with wooden fairings; the ribs are of spruce. The engine mounts are carried on four struts each side, and the chassis is attached below the engine mountings, thus minimising the load in the anti-lift wires.

### Fuselage.

The fuselage is of Monocoque construction forward, where the sickbay accommodation is provided. The shell is of "Consuta" laminated sewn spruce plywood, made watertight to ensure floating if a descent on the sea is necessary, and the large windows and doors in the side are designed to prevent entry of water in the event of this mishap.

The after part of the fuselage is of wood and swaged tie-rod construction, the longerons being made under Vickers-Ryan patents.

### General.

Throughout the machine streamline steel tie rods are used in external bracing, and round steel rods in all internal bracing. Looped wires and ferrules are not used in any important part.

The engine controls are operated by rods and torsion shafts. The main controls are of cable, and follow standard practice.

The petrol supply is maintained by fan-driven petrol pumps with regulating valves to maintain a constant flow to a service tank with overflow return to main tanks.

### Strength.

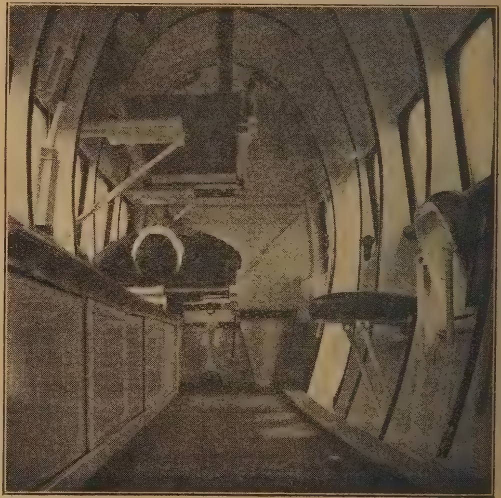
The strength of the main structure is guaranteed not to be less than the following standards, when carrying the full load specified hereafter :—

| | |
|---|---|
| Load Factor on front truss with centre of pressure forward | 4 |
| Load Factor on rear truss with centre of pressure back ... | 4 |
| Factor in nose-diving case ........................................ | 1 |

### Interior Equipment.

The two pilots are accommodated in the pilot's cockpit in the nose of the aeroplane, side by side, and are provided with full dual control. A wide and unimpaired view of the ground is available.

Racks for four stretchers of the standard "General Service" pattern as used by the R.A.M.C. are fitted on the side of the cabin opposite to the doors. The stretcher frames are so arranged that there is adequate clearance space between the ends of the cabin and the handles, and also between the handles of each stretcher at the centre. The racks are so arranged that there is sufficient lateral floor space to allow of lifting the stretchers onto the racks without tilt-



The interior of the sick bay.

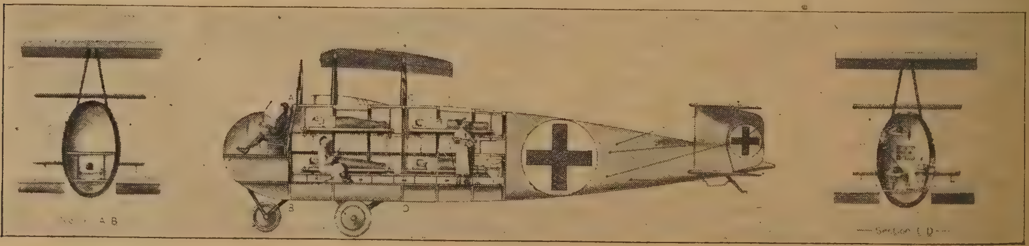


Diagram of the accommodation on the Vimy Ambulance.

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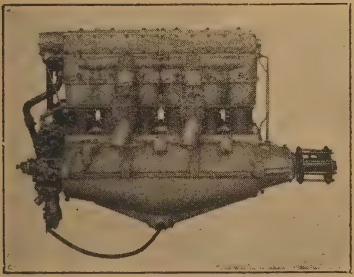

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ing them. They can be folded up out of the way when seating accommodation is required.

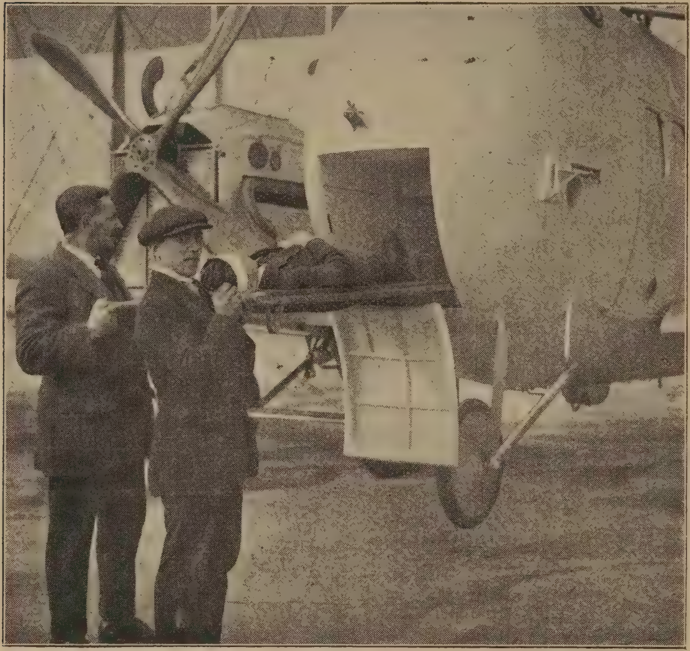
A door is provided in the front of the luggage compartment, under the pilot's seat, allowing of the loading and unloading of the stretchers, thereby effecting a direct and straight entrance to the cabin. Suitable runners are fitted on the floor to facilitate sliding the stretchers into the cabin. This method of handling the patients entirely eliminates the possibility of congestion or turning of corners.

A fan with suitable drive is fitted in the front wall of the cabin, opposite the passage way, driving air through a screen, down which a constant drip of water can be maintained. This fan is capable of operation when the aeroplane is stationary on the ground. The rate of flow of the water is easily regulated from inside the cabin; an even and cool temperature can therefore be maintained in tropical countries.

Ample lavatory accommodation is installed, together with a wash basin, cupboard and drawers with a rack for bottles.

A 15-gallon water tank is provided for use with the lavatory, separate tanks of smaller capacity being provided for the cooling apparatus, wash-basin and for drinking. A tap is fitted to this latter in a position suitable for the dilution of disinfectants.

Ample door space is provided for rapid evacuation in case of emergency.



Embarking a stretcher case on the Vickers Ambulance.

The following are the main details of this machine :—

SPECIFICATION OF THE VICKERS "VIMY" AMBULANCE.

| | |
|---|---|
| Dimensions :— | |
| Overall length | 42 ft. 8 in. |
| Overall height | 13 ft. 3 in. |
| Span | 68 ft. |
| Gap | 10 ft. |
| Chord | 10 ft. 6 in. |
| Area of main planes | 1,330 sq. ft. |
| Load carried :— | |
| Crew (2) | 360 lb. |
| Four patients and stretchers | 760 lb. |
| Attendants (2) | 360 lb. |
| Wireless equipment | 100 lb. |
| Water and tank (medical) | 165 lb. |
| Medical equipment | 105 lb. |
| Stores | 200 lb. |
| Total service load | 2,050 lb. |
| Petrol (167 gall. for 5 hr.) | 1,200 lb. |
| Oil (14 gall. for 5 hr.) | 140 lb. |
| Reserve water (4 gall.) | 40 lb. |
| Total load | 3,430 lb. |
| Performance :— | |
| Speed at 6,500 ft. | 109 m.p.h. |
| Climb to 6,500 ft. (with 4,070 lb. load) | 10 min. |

N.B.—Instead of four lying-down or stretcher cases, eight sitting-up cases can be carried, increasing the above load to 4,070 lb.

## THE OEMICHEN HELICOPTER.

Amongst the many experimental helicopters now being experimented in France, the Œmichen is probably the most curious. The designer, Mr. Œmichen, has given much attention to the flight of birds and insects, and in a treatise which he has published upon the subject he advances and attempts to substantiate a theory to the effect that the wings of birds and insects regain from the air disturbed by their wing-beats some of the energy which those wing-beats have themselves given up to it. His helicopter is based in its design upon this theory, and the special type of airscrew blade used on it is claimed to be thus regenerative, in that energy spent in producing eddies in the air is given back by the air to the blades.

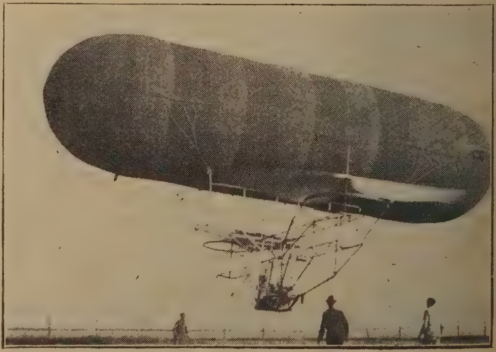
The experimental machine, which is shown in a photograph some few feet above the ground, was designed purely for trials of these special airscrews. The machine consists of a horizontal lattice girder carrying at its ends two of these special screws, each two bladed. In the centre is the engine, an ancient two cylinder horizontally opposed Dutheie-Chalmers of the type used in the old Santos Dumont Demoiselle monoplane of 1909, developing 25 h.p., and driving the airscrews by long belt drives. Alongside the engine is a seat for the pilot. The whole is suspended from a small balloon, which it is claimed acts mainly as a stabiliser for the apparatus.

The weight of the whole machine, including pilot, is given as 336 kg., and the balloon, of very heavy fabric and of a capacity of only 144 cubic metres, is said to have a surplus lift of only 71 kg., leaving 265 kg. to be lifted by the airscrews.

The machine has made numerous ascents, reaching at times a height of 4 metres. If the figures are accurate, a vertical lift of 11 kg., or 24 lb. per h.p., has been attained—a very high figure considering the moderate diameter of the airscrews.

The machine described is merely a testing bench for the screws. It is fitted with no controls, and is not regarded as in any sense a practical aircraft.

The results attained have encouraged the inventor to proceed with the design and construction of a more advanced type, which is to be without the balloon attachment, and which will be fitted with stabilising and control gears, and with a means of horizontal propulsion. No details as to this design are available, but the French Technical Authorities are stated to be interested in the affair.



The Œmichen assisted helicopter in the air.

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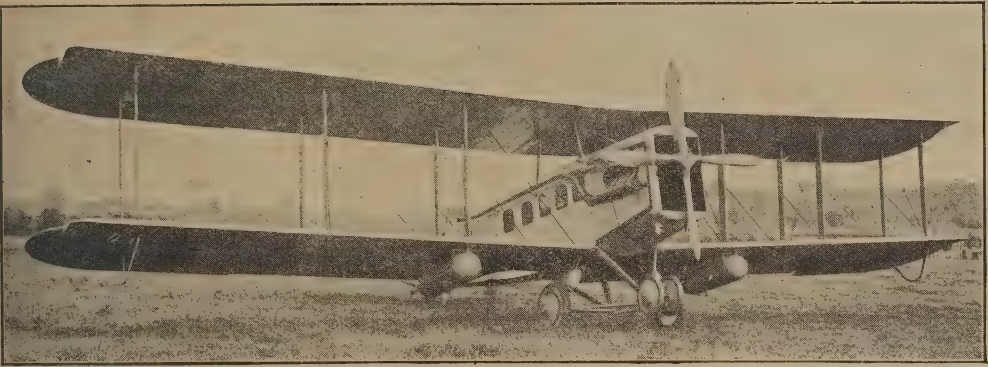

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Petters Limited, winners of the first prize in the British Air Ministry Competition, 1920, now have at their Westland Aircraft Works, Yeovil, for delivery the following Aerial Fleet:—

1. **Westland Rolls-Royce Limousine** - Capacity: 3 passengers and light luggage.
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# THE STRUCTURAL DESIGN OF AIRCRAFT.

Following after the annual general meeting of the Institution of Aeronautical Engineers, which was held in the rooms of the Royal Society of Arts at 8 p.m. on March 15th, a lecture was read on "Practical Points in the Design of Aircraft Structures," by Dr. A. P. Thurston. Mr. H. P. Folland, M.B.E., occupied the Chair.

A brief résumé of the paper and the discussion are given herewith.

An aeroplane structure is the *summus mons* of engineering construction, and its efficient design requires the most perfect application of engineering principles and calculations. These principles include :—

(*a*) A correct knowledge of the strength and properties of the materials of construction under all conditions of use.

(*b*) A correct estimation of the maximum loads which can come upon the structure.

(*c*) A correct selection of the positions of loading to cover all the conditions of loading in flight.

(*d*) A "complete" and efficient type of structure so that the maximum advantage is taken of the various properties of the various materials of construction.

(*e*) A sound method of calculation.

With regard to (*e*) the properties of wood are such that the actual breaking strengths and the calculated strengths can never be relied upon to be within 30 per cent. of each other. It is obviously unsound to expend great labours upon the elaboration of mathematical methods which in no case vary more than 3 per cent. in their results.

Practical methods consist in designing the various members according to the results of tests of previous machines, structures, or specimens. Theoretical methods consist in designing by calculation from first principles. Practical methods incorporate with the best mathematical methods the pooled experience of previous designers, whereas theoretical methods risk the omission of some important principle owing to the limitations of the designer's experience or the limitations of mathematical expression. Highly efficient machines can be evolved by practical methods of design, but they cannot be evolved with safety by theoretical methods. Hence engineers of experience adopt practical methods of design, whereas mathematical students invariably have a bias for theoretical methods until matured by experience. It is the duty of a designer to evolve the most perfect and the safest design by the simplest methods.

Thereafter Dr. Thurston set forth the various conditions of loading which have to be considered—such as wing loads with c.p. forward and aft, down-load on leading edge, drag-loads in diving, tail loading, etc., and the methods by which the maximum loads which occur in practice can be evaluated. He instanced the use of the camera obscura to determine the flight path of a machine in evolution, and the computation of the accelerations involved as illustrated by the case of Major V. B. at Farnborough, who turned over the camera so rapidly that an acceleration of 4.5 times gravity was computed, and that he (V. B.) became unconscious; as well as the case of another pilot who, to convince a designer that his elevators were too weak, went up and broke a set.

In addition to the camera obscura, the Wimperis accelerometer, and the use of the cinema permitted such estimation. To determine the factors to be allowed to take care of such loads Dr. Thurston said recourse must be had to a comparison between the maximum air loads so deduced, and the breaking loads, under sand test, of machines which experience proved to be satisfactorily strong. A factor of two on the maximum air load was desirable.

The more usual method of stating load factors was in terms of normal loading. Stated in this form small and high speed machines require larger load factors than large and slow ones. A number of instances of failures of aircraft under loads to which inadequate attention had been given were recorded, particularly that of down load on the leading edge.

The importance of securing a complete structure with effective duplication of each vital member was pointed out.

The importance of accurate data as to the strength and properties of the materials used was insisted upon, and as a classic instance of error in this respect Dr. Thurston instanced the fact that the R.N.A.S. were in the habit of crediting spruce with an ultimate strength in combined bending and compression of 8,500 lb. per sq. in., whereas the Directorate of Military Aeronautics employed the correct figure of 5,500 lb., and in consequence all naval machines were 35 per cent. below strength. [With the result that Naval machines generally had a better performance than Army machines, and in practice did not break any more often.—Ed.]

As to the particular methods to be used for calculating the strength of aircraft, Dr. Thurston stated that almost any sound method gave equally satisfactory results if employed with judgment and on a sound basis. All methods of calculation were based on a theory of the elasticity of materials so far from the truth that they depend for their value entirely upon a sound experimental justification of the constants used.

**Mr. Folland**, opening the discussion, said that Dr. Thurston's paper was one of great practical value. Sound and careful design of details to secure that all parts should be available up to their full strength was the most important factor towards the production of a safe aeroplane. He thought that standard practice in regard to load factors was irrational in that it was customary to allow the same load factor over the whole of the wing truss, for instance, irrespective of the nature of the particular member. He thought that lift wires, for instance, should be given a factor higher than that of the struts and spars to cover the effects of vibration. The question of vibration raised one of those points of design wherein theory, without experience, could be of no assistance. He did not think anyone could produce a satisfactory theory for the design of engine mountings.

**Sir George Greenhill**, after a reference to the curious structural design of a flying machine attributed to Alexander the Great, said that he gathered that before it had been possible for airmen to take the risks of aerial stunting it had been thought wise to examine in the light of mechanical theory the possibilities of their doing so safely. This was an illustration of the value of theory as a guide when direct experience was not already available.

**Capt. Sayers** referred to Dr. Thurston's aspersion as to the safety of machines built to R.N.A.S. specification, said that he had built machines to R.N.A.S. strength requirements, and had never been able to discover what methods of calculation were employed. But although the figure of 8,500 lb. per sq. in. appeared as an official breaking strength for spruce, in at least one case a machine was slightly under strength according to the R.N.A.S. experts, was re-stressed according to Dr. Thurston's method and figures, and found to be about 1.5 up on the doubtful factor. Actually the R.N.A.S. methods were specifically of the trial and error type, and if they used too high a figure for the strength of spruce they had corrected this by some compensatory assumption. In practice very few R.N.A.S. machines broke in the air, which was justification of the calculations used.

**Mr. Chadwick** thought the time was coming when metal would be used in place of timber for aircraft construction. There was little use in spending many days in elaborate calculations as to the strength of an aeroplane when the material itself might drop to half its nominal strength before the machine was deleted.

**Major Wyllie** took exception to Dr. Thurston's indiscriminate use of load factor or factor of safety. He understood load factor to mean the number of times normal load required to cause breakage. Factor of safety was generally used to denote the ratio between working stress and breaking stress—quite another affair. This was illustrated by a metal spar which at a load factor of 8 had a maximum stress of 40 tons per sq. in. The breaking stress was 80 tons and the factor of safety 2. But the breaking load factor was 9, not 16.

**Mr. W. O. Manning** referred to Dr. Thurston's curve of suitable load factors for machines of varying sizes. He regretted they did not go beyond 600 sq. ft. From the look of the curves it appeared as though the factor would vanish by 20,000 sq. ft., which was obviously wrong. Complicated methods of calculation were useless for drawing office purposes and led to risks of error.

**Major A. R. Low** said that Dr. Thurston was in the main laying down sound advice for young designers. He personally though Dr. Thurston's distinction between theoretical and practical engineers untenable. He only recognised two types—good ones and bad ones. If a good engineer found mathematics a useful and accurate tool he would use them. But mathematics were above all things dangerous to those who could not handle them properly. If a good engineer were so handicapped he soon found that he cut his fingers in the attempt to use them, and so gave them up and trusted to codified experience. Engineering capacity was really a faculty for reasonably sound guessing, and provided the guessing was sound the guessing methods used did not matter.

**Dr. Thurston**, replying, agreed with the majority of the speakers as to the points raised. To Mr. Manning he said the curves of load factor were not straight lines, and would cease to fall below a factor of $3\frac{1}{2}$. As to Mr. Chadwick's remarks on metal he entirely concurred. Metal avoided many uncertainties inherent in wood, and had the advantage that its very large extension before failure meant that much work must be done on it to break it even when it was stressed to nearly the limit. It thus gave plenty of warning before breaking. He pleaded guilty to using "load factor" and "factor of safety" loosely, but thought he was intelligible.

As to Capt. Sayers' defence of R.N.A.S. methods, it was a fact that many machines accepted by the Navy had to be strengthened for fighting in France.

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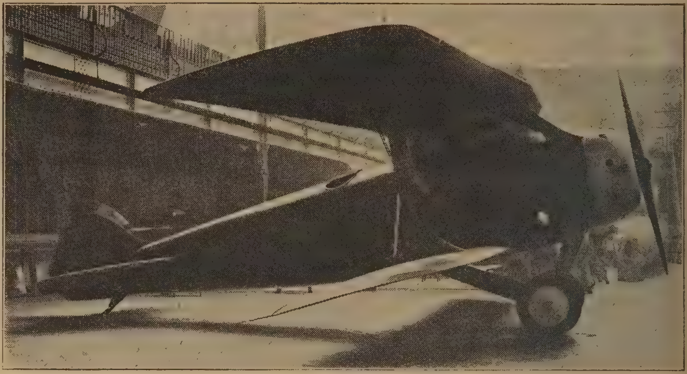
## TWO RECENT SPADS.

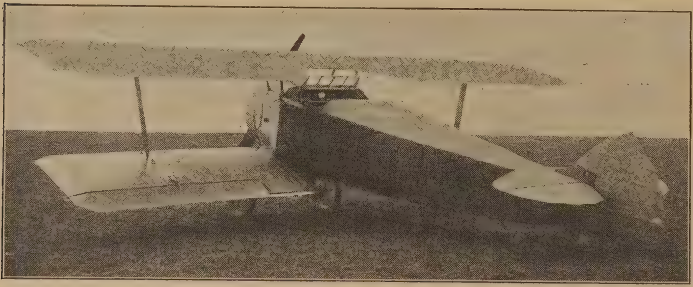


The Spad type S33 (250-h.p. Salmson engine).

The Spad Herbemont, type S33, has been designed as a six-seater with sufficient fuel for a six-hour flight at 175 km.p.h. The fuselage, of monocoque construction, carries a 250-h.p. Salmson engine in the nose. The cabin is situated under the centre section and has comfortable accommodation for five passengers.

The petrol tanks are carried on the top plane, which gives more room in the fuselage and at the same time minimises the danger of fire.

The Spad Herbemont, type S34, is a side-by-side two-seater training biplane, fitted with an 80-h.p. Le Rhône engine. Its construction has been carried out with a view to ease of replacement. With an 80-h.p. Le Rhône the top speed is 135 km.p.h., but fitted with either a 130-h.p. Clerget or a 120-h.p. Le Rhône, all of which are interchangeable, a considerable increase in performance is obtained.



The Spad type S34 (80-h.p. Le Rhône).

The six-seater type S33 has been used by the Compagnie des Messageries Aériennes, and under the pilotage of Lieut. Casale has made a number of trips between Paris and London during the past month. The identity marks of this machine are F-CMAZ.

Both machines show the characteristics of the recent designs of M. Herbemont, in the form of a back-swept upper wing combined with a straight lower wing, one single I strut on each side of the wings, and the curious balanced rudder with a sharp peak on its upper extremity.

## A BOATING ACCIDENT.

According to the Daily Press, an aircraft designer of the name of Beadle, said to be connected with the construction of flying-boats at Cowes, was drowned in an accident to a sailing-boat at Kingston on Sunday, March 13th

Mr. Beadle, who in 1914 was associated with the late Mr. Copland Perry in the design of the Perry-Beadle biplane, who was later well known for his work at the Norman-Thompson Flight Co., Ltd., at Bognor, and who has latterly been with the firm of S. E. Saunders, Ltd., where he was responsible for the design of the "Kittiwake," attended the meeting of the Royal Aeronautical Society on the evening of March 17th. He showed none of the usual symptoms of drowning, and admitted to no recollection of his alleged demise.

## AMERICAN COMMON SENSE.

It is interesting to notice the common-sense method by which the air mail proposition is being handled in the States. No extra charge is made for delivering letters by air between Cleveland, Washington and New York. There is no need to go out and get special little blue stickers, which are as often as not out of stock when one applies for them at a post office. All the American business-man does is to buy for himself a rubber stamp which has on it the words, "Deliver by AIR MAIL if possible," the words "Air Mail" being in large letters.

Urgent letters are thus stamped by the firms, and one understands that they are in consequence given priority by the postal authorities. That is to say, the letters marked to go by air mail are sent thus up to the capacity of the machine, while the less important letters are sent by ordinary post.

Some day, perhaps, the British Post Office will awake to the fact that it pays it to send letters abroad by aeroplane instead of by boat, and we shall have done with the stickers and extra postage stamps. By that time probably all mails in the United States will be carried by air.

## A NEW AMERICAN ENGINE.

It is reported that the Packard firm, of Detroit, have now produced and tested a twelve-cylinder Vee type engine of the over-compressed and over-dimensioned type designed for high altitude work.

The engine is based generally on their standard 270-h.p. model, but is fitted with cylinders of $\frac{1}{4}$ greater bore and a compression ratio of 6.5 to 1, and is designed for a normal output of 300 h.p.

## TRADE NOTES.

### Cellon Dope.

Owing to the cessation of aircraft manufacture by a large number of firms who took up this class of work during the war it has been found that in numerous cases supplies of Cellon dope and dope coverings, identification mark colours, brush washes, etc., have been purchased by firms outside the Aircraft Industry, who from time to time offer them for sale to those who are still carrying on in the industry.

Cellon, Ltd., would like to point out that while they are at all times prepared to report and advise on the use of any of their own materials which are in the hands of aircraft builders, they cannot accept any responsibility for materials purchased from outside sources.

### Smiths and Smiths and Smiths.

It is of interest to note that on the Ross Smith flight from England to Australia the revolution indicators, air speed indicators, radiator thermometers and Husun compasses were all supplied by S. Smith and Sons (M.A. Ltd.).

In the travelogue now holding the boards at the Philharmonic Hall a photograph is shown in which the Smith revolution indicator can be quite clearly seen.

A complete exhibit of these instruments together with the famous K.L.G. plugs used may be seen in the vestibule of the Philharmonic Hall.—G. D.

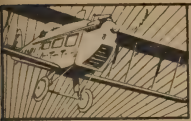
## COMPANY NOTICES.

### Proposed Voluntary Liquidation.

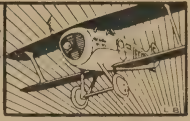
The Triplex Safety Glass Company, Ltd.—It is notified by the secretary that an extraordinary general meeting of the above-named company will be held at the Cannon Street Hotel, E.C.4, on Thursday, March 24th, 1921, at three o'clock p.m., for the purpose of considering and, if deemed desirable, of passing the following resolution, with or without modification :—" That the company cannot, by reason of its liabilities, continue its business, and that it is advisable to wind up the same, and that the company be wound up accordingly, and that Sir Walrond Sinclair, K.B.E., of 12, Lower Grosvenor Place, S.W.1, and Mr. Andrew Wilson Tait, of the firm of Messrs. G. A. Touche and Co., chartered accountants, Basildon House, E.C.2, be appointed joint liquidators for the purpose of such winding up "

### Receivership.

United Aircraft Co., Ltd.—H. Holmes, of 2, Fenchurch Avenue, E.C.3, ceased to act as receiver or manager on Feb. 19th, 1921.



# COMMERCIAL AERONAUTICS



## AND CIVIL AERIAL TRANSPORT.

# THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

## OFFICIAL NOTICES.

## CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M): next the number of passengers: and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A—Messageries Aeriennes; I.A.L.—Instone Air Line; S.F.S.—Surrey Flying Services; G.E.A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco Roumanie, M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

## The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

### MARCH 14th:

M.A., Spad, F-CMAW, London-Paris, 12.52-15.13, M., 2, Le Sec.
S.N.E.T.A., DH4, O-BALO, London-Brussels, 13.00-15.20, G.&M., 2, Delzenne.
M.A., Breguet, F-CMAG, Paris-London, 12.36-15 10, M., 3, Le Men.
G.E.A., "Goliath," F-FHMU, London-Paris, 12.57-15 57, G.&M., 5, Favreau & 1.

### MARCH 15th:

G.E.A., "Goliath," F-FHMU, London-Paris, 12.45-17.27, G.&M., 7, Favreau & 1.
M.A., Breguet, F-CMAI, Paris-London, 09.07-11.42, M., 3, Malfanti.
M.A., Breguet, F-CMAF, Paris-London, 11.44-13.40, M., 2, Le Sec.
M.A., Breguet, F-CMAB, Paris-London, 11.46-14.15, Nil, 1, Challoux.
S.N.E.T.A., DH4, O-BATO, Brussels-London, 12.55-15.00, G.&M., 2, Wouters.

### MARCH 16th:

M.A., Breguet, F-CMAI, London-Paris, 13.00-15.54, G., 3, Malfanti.
M.A., Breguet, F-CMAG, London-Paris, 13.05-15.56, G.&M., 3, Le Men.
M.A., Breguet, F-CMAB, London-Paris, 13.06-15.55, G., 3, Challoux.
S.N.E.T.A., DH4, O-BATO, London-Brussels, 13.05-15.05, G.&M., Nil, Wouters.
G.E.A., "Goliath," F-FHMU, Paris-London, 11.37-14.23, G.&M., 12, Labouchere & 1.
S.N.E.T.A., DH4, O-BADO, Brussels-London, —14 45, G.&M., 1, Van Opstal.

### MARCH 17th:

S.N.E.T.A., DH4, O-BADO, London-Brussels, 12.45-16.00, G.&M., Nil, Van Opstal.
G.E.A., "Goliath," F-FHMU, London-Paris, 12.50-15.50, G.&M., 2, Labouchere & 1.
G.E.A., "Goliath," F-GEAD, Paris-London, 11.47-14.45; G., Nil, Patin & 1
M.A., Salmson, F-CMAE, Paris-London, 11.49-14.30, G., Nil, Challoux.
M.A., Breguet, F-CMAH, Paris-London, 11.50-14.34, M., 3, Le Men
M.A., Spad, F-CMAY, Paris-London, 12.15-08.45/18th, M., 2, Casale.

### MARCH 18th:

M.A., Spad, F-CMAY, London-Paris, 12.51-14.45, Nil, 2, Casale.
M.A., Breguet, F-CMAH, London-Paris, 12.53-15.05, Nil, 3, Le Men.
M.A., Salmson, F-CMAE, London-Paris, 12.54-15.00, G.&M., Nil, Challoux
G.E.A., "Goliath," F-GEAC. Paris-London, 11.55-15.50, G.&M., 9, Favreau & 1.
S.N.E.T.A., DH4, O-BALO, Brussels-London. —14.58, G.&M., Nil, Delzenne.

### MARCH 19th:

G.E.A., "Goliath," F-GEAD, London-Paris, 12.40-15.25, G.&M., 8, Patin & 1.
S.N.E.T.A., DH4, O-BALO, London-Brussels, 12.42-14.47, G.&M., Nil, Delzenne.
M.A., Breguet, F-CMAI, Paris-London, 11.39-14.34, Nil, 3, Malfanti.
M.A., Spad, F-CMAW, Paris-London, 11.40-14.19, G., 2, Le Sec.
M.A., Breguet, F-CMAG, Paris-London, 11.42-14.40, G., Nil, Briere.
S.N.E.T.A., DH4, O-BADO, Brussels-London, 11.20-14.19, G.&M., Nil, Van Opstal.
S.N.E.T., D.H.4, O-BATK, London-Brussels, 13.00—, Nil, Nil, Blackburn

### MARCH 20th:

NIL.

## The Air Port of Cricklewood.

### MARCH 19th.

H.P.T., O/400, G-EATM, London-Paris, 12.00-15.17, G.&M., 7, Hope & 1.
H.P.T., DH9, G-EAUC, London-Paris (for Athens), 12.00-14.12, Nil, 2, Perry

## Air Port Statistics.

### CONTINENTAL

Machines, 35; Passengers, 92; Crew, 43; Total Personnel, 135.

## Inland Flying at Croydon.

March 14th.—Nil.
March 15th.—H.P.T., DH9, Cricklewood return.
March 16th.—I.A.L. "Bat" to Hendon (Chattaway)
March 17th.—S.F.S., Avro to Birmingham (Hayden); P.L. Westland Yeovil return (Keep); Vickers "Viking III" from Weybridge (Cockerell); L.A.S., DH6, Leatherhead return (Knowles).
March 18th.—Vickers "Viking III" test (Cockerell)
March 19th.—M.W.T.C., DH6, test (Lovell); L.A.S., DH6, Leatherhead return and joy-riding (Knowles).
March 20th.—L.A.S. DH6 Leatherhead return and joy-riding (Knowles); I.A.L., "Vimy" joy-riding (Barnard).

## The London Terminal Aerodrome.

Croydon has suddenly taken upon itself a most cheerful atmosphere. English can, once more, be heard spoken in the "Trust House" and M. Bouderie and his "Goliaths" once more are getting their undercarriages and legs pulled.

To make it still more like the old days of last summer, some of the old pilots are returning in varying capacities. Messrs. Forson and Robbins are test pilots to the Aircraft Disposal Company and Mr. Powell has joined the Instone Air Line. Capt. Shaw and Mr. Brenard of the late A.T. and T. were also there on Saturday.

The I.A.L. have taken their fleet to the big single hangar which will soon probably apply for representation in the League of Nations, since it will contain some half dozen "Cities." They have also taken over the big block of offices which at one time contained the A.T. and T. personnel. Visitors can be in no doubt as to the present proprietorship.

On Sunday Mr. Barnard on the "City of London" Vickers was doing wireless tests in a squall and gave an excellent demonstration of the Einstein Theory of Space-Twist. Mr. Powell made his debut as a "Vimy" pilot on this occasion.

On Saturday Mr. Knowles was performing in Mr. Chapman's "City of Leatherhead" (which the D.H.6 has been called by the unbelievers). During the course of the afternoon he executed a most excellent "Immelmann." The following day he was again carrying passengers and doing "climbing dives" in a strong wind.

Mr. Blackburn, starting off to deliver a new D.H.4 to Brussels for S.N.E.T.A., startled everyone (and possibly also himself) by a rather alarming spin, after which he disappeared Brusselswards.

Capts. Cockerell and Broome arrived at Croydon on Thursday on the "Viking III," after flying from Brooklands and landing at Lambeth, and alighting at Westminster en route. Capt. Cockerell had the machine out for a test on Friday. The "Viking" will live at Croydon until further notice.

On Monday the Instone "Vimy" reopened the Paris route as described elsewhere, and Mr. Forson went off on a S.N.E.T.A. Avro to Brussels. This machine had previously been tested by Mr. Robbins, who landed it just as one should land on an Avro.

Mr. Robbins felt most poetic after this landing and is considering retaining the poet-laureate for future occasions. Anyone desirous of writing a poem on the subject (to be limited to 50 stanzas) should forward same to this paper, which will deliver it to the pilot. Budding poets must be tactful and not talk about little red robins going hop, hop, hop.

It seems that in about a month's time the London Terminal Aerodrome will be a very busy place indeed.—G. D.

## Night-Flying Arrangements.

To assist in the successful development of night-flying facilities, principally in connection with the Continental services, experiments have been carried out by the Department of Civil Aviation at the London Terminal Aerodrome, Croydon, and along the route to the Channel coast, with various types of aerial lighthouses, searchlights, pyrotechnic lights, and obstruction and landng lights.

In order that these different forms may be thoroughly tested, it was arranged that the civil airship G-FAAG (late H.M. Airship R.33), which is now carrying out mooring-mast experiments at Pulham, should undertake an observational flight along the London-Folkestone route.

The programme arranged was that the airship should leave Pulham shortly after dusk and proceed over London to the neighbourhood of Croydon Aerodrome, and test the range and efficiency of the aerial lighthouse and searchlights from the point of view of easy location of aerodromes. Observers will also decide on the value of certain pyrotechnic aids to navigation and examine the obstruction lights, and, if they are completed, the illuminated landing "Ls" which are being fitted to provide a semi-automatic indication to aeroplane pilots of the direction and position in which they should land and take off. Observation will also be made of a new "Cone" light which is being experimented with as a local pilotage light at aerodromes. This light is projected downwards on to a white cone, and, if found to be satisfactory, will be used as the main location light at civil aerodromes, the aerial lighthouse proper being reserved for marking intermediate points on routes.

From Croydon the airship will proceed along the London-Continental route to Lympne, where she will survey from the air a spot that has been tentatively selected for an aerial lighthouse. For observation purposes a small war-type lighthouse has been temporarily erected on the spot.

The ship will then pass over the coastline and will carry out observations of various types of marine lighthouses and light-vessels, in the Channel and the North Sea, which are visible from the air.

During the flight wireless practice for direction-finding purposes will be carried out, and general wireless telegraph and telephone communication will be maintained with land stations.

In connection with the above experiments it was announced by the Air Ministry that Airship G-FAAG left Pulham at 23:00 p.m. on March 17th and flew within sight of Croydon and back.

### The Air Port of Westminster.

On Thursday last Capts. Cockerell and Broome with Capt. Oliver Vickers as passenger flew on the Napier-engined Vickers "Viking III" from Weybridge and alighted on the Thames between Westminster and Lambeth Bridges. He then taxied the machine under Lambeth Bridge and crawled out on his undercarriage on to the hard on the South bank.

After a few minutes' stop he refloated and took off in great style, clearing the next bridge by about a thousand feet and flew to Croydon, delivering the machine to the C.A.T.O.

### Civil Airship G-FAAF.

Civilian airship G-FAAF (late H.M. Airship R.36) is now practically complete and ready for trials. It is understood that she will make her trial flights this week at Inchinnan Aerodrome, Renfrew, and then be flown to Pulham airship station in readiness for the forthcoming demonstration flights to Malta and Egypt to be made this spring.

She has sleeping and dining accommodation for 50 passengers, with a crew of 4 officers and 24 men. A full wireless equipment is carried and all the engine-cars are in telephonic communication with the main control car. She is fitted with 3-350 h.p. Sunbeam "Maori" and 2-260-h.p. Maybach engines, giving a total horse-power of 1,570.

Here principal dimensions are: Length, 672 ft (30 ft. longer than the R.34); Maximum diameter, 78 ft. 9 in.; Cubic capacity, 2,100,000 cub. ft.; Nominal lift, 63.8 tons; Maximum speed, 65 m.p.h.; Normal cruising speed, 50 m.p.h.; Range, over 4,000 miles.

### A Commercial Flight

By arrangement with the LepAerial Travel Bureau, Mr. Hackett, of the De Havilland Aircraft Company, flew on a D.H.9 to Liverpool to bring back some photographs of the Grand National. They appear to have had a very rough journey both ways, but finally landed at Romford and delivered the photographs to time.—G. D.

### Brooklands.

Two members of the technical staff at the Vickers (Brooklands) works lost their lives in a boating accident which occurred on the Thames at Kingston on the 13th. They were Mr. Edward Beadle, aged 24, and Mr. Thomas Brampton Hall, 34, and had been sailing in Mr. Beadle's sailing dinghy. The body of Mr. Hall has not been recovered, but at the inquest on Mr. Beadle a verdict of "Accidental death" was given.

Mr. Beadle was a very promising aircraft engineer and designer. Mr. Hall, who leaves a widow, was a son of the late Mr. Robert Hall, B.A. (for many years headmaster of Needham Market Grammar School, Suffolk), and had had a brillian scholastic career, winning the King Edward Scholarship tenable at St. Mark's College (Chelsea), and passing the Inter-Bachelor of Science examination at London University. He studied mathematics (as applied to aviation) under his brother, Mr. C. Johnstone Hall, who was then chief draughtsman at the Aviation Department, Vickers Ltd., and is now a chief designer in the Directorate of Research, Air Ministry.

The late Mr. Hall was subsequently appointed mathematical assistant at the Weybridge works. Both men were well-known and popular members of the staff, from whom a wreath was sent to the funeral of Mr. Beadle.—J. F. S.

### A Demonstration at Southampton.

On Monday, March 14th, the Supermarine Aviation Works, Ltd., had arranged to demonstrate one of their Supermarine Mark II Puma Channel-type flying-boats to members of a foreign Government.

They arrived at Southampton in very inclement weather, a full gale of wind blowing and a strong spring tide running. Even in the sheltered water in which the works lie above the Floating Bridge of the River Itchen, adjoining Southampton, there was a sea-way running from four to five feet high.

The machine was launched, taxied round about the river, and took off in exactly 5½ seconds after the opening up of the engine, the passengers being the Naval Attaché and the Head of the Naval Air Service of the foreign Government in question. They were flown down and round about the Isle of Wight, brought back to Southampton, and landed in the outside of Southampton Water, with a very heavy sea and a wind velocity of 45-50 miles an hour.

The greatest difficulty experienced with sea-going craft is taxying the machine on the water with a following wind, and it speaks very well for the design and construction of the craft that the Supermarine flying-boat was taxied with this velocity of wind astern, and with an ebb tide, over about a mile and a half, during which the machine was turned round port and starboard, and was at all times under the complete control of the pilot.

The machine was taxied into the slipway, where the crew disembarked, and was landed on launch trolley, hove out of the water and safely ashore in exactly 14½ minutes, the landing crew consisting of the boatswain and five hands, the wind being abeam of the vessel during these operations.

The amount of water taken aboard was about 28 lb., which is extraordinary when it is considered that the machine was voluntarily taxied over 2¼ miles in a head, beam, and following sea for demonstration purposes, in a full gale of wind. It is to be noted that on this occasion it was not the question of a hard wind blowing up suddenly over a smooth sea, but the sea conditions of some days' hard weather.

### Woking.

One is informed that the F.6 machines ordered from Martinsyde, Ltd., for Spain, are to be altered in one or two respects from the usual type, and that machine-guns are being fitted.—J. F. S.

## THE BRITISH DOMINIONS BEYOND THE SEAS.

### NEWFOUNDLAND.

### An Air Mail to be Inaugurated.

The Post Office authorities announced, on Feb. 23rd, the inauguration at an early date of an aeroplane mail service in the north portion of the island. The usual postal rates will be charged.

### AUSTRALIA.

Mr. W. J. Warneford, formerly a director and publicity manager of the Australian Aircraft and Engineering Co., Ltd., Sydney, is now associated with the Studebaker Corporation of that city.

He was one of the founders of the firm, and joined Mr. H. E. Broadsmith in negotiating the agency of A. V. Roe and Co., Ltd., for Australia, which was completed in September, 1919

Operations in the Commonwealth were commenced in Jan., 1920, and since then some very successful business has been transacted, and quite a considerable amount of passenger-carrying accomplished.

### The Australian Air Force.

The Australian Air Force will consist of eight squadrons, with headquarters at Sydney and Melbourne. Each squadron in war formation will comprise eighteen machines in three flights of six.

The Avro 504K, of which a large number have been presented to the Commonwealth by the Imperial Government, will be the standard training machine.

### SOUTH AFRICA.

### A New Venture.

The first aeronautical auction sale in South Africa was held on Dec. 7th, 1920, when the entire stock of the South African Aerial Transports, Ltd., was put up for sale. As originally intended, the property was put up as one lot, and was provisionally sold to Capt. Ross and Lieut. Thompson, both pilots of the ill-fated S.A.A.T., Ltd., for £950. It was then offered piecemeal, but as an aeroplane is of little use as a table ornament, and as the various other items could not very well be divorced, it was agreed that the original sale should stand.

The new owners will start a new company on sensible lines in an endeavour to make flying not only popular but remunerative from the point of view of the promoters.

### The Ross-Thompson Company.

According to the Johannesburg *Star* "the Ross-Thompson Combine continue to do good work in a quiet way to popularise flying. Paradoxically enough, the aerodrome at Baragwanath, though one of the best imaginable, is one of their greatest handicaps; it is not easily reached by the public. Nevertheless, during the New Year holidays there was always a fair attendance to watch the machines and quite a number of passengers went for short joy-rides around the aerodrome or for longer ones over the town. The novelty of flying appeals to most, and the risks only to those who fail to realise them in their true proportions.

"It is well to reiterate that since S.A. Aerial Transports started, we have had 15 months' experience of commercial flying, and with Baragwanath as a centre the aeroplanes have toured many thousands of miles in the four Provinces and in Rhodesia. Over 8,000 passengers have been carried, and no other form of transport can point back to a safety record within even measurable distance of that set up by the airmen and ground staff.

"The Ross-Thompson Company are doing all that is humanly possible to maintain that record, and are bidding for increased public support by acquiring the use of a flying ground more conveniently situated, near Orange Grove and the Sydenham township.

"It may be interesting to note that the new ground was the scene of one of the earliest efforts at aviation in this country when, some 10 years ago, Kimmerling made a series of hops above the surrounding trees on an Antoinette monoplane. These hops are now lengthened out to any distance you please. Nowadays it is purely a matter of cost: not a matter of flying."

# FOREIGN INTELLIGENCE.

## ARGENTINA.

### British Enterprise Abroad.

The River Plate Aviation Co., promoted in July, 1919, by Major S. G. Kingsley, has completed its first year's working and it is very gratifying to learn that this prodigy of British enterprise and initiative in a foreign country, and on a nascent industry like aviation, has been able to show a substantial profit so soon.

It speaks very highly for the efficiency of the organisation, the staff, and the material employed, as the Argentine being a neutral country and one far distant from the war was until a year ago in very much the same stage of development in regard to aviation as Great Britain was before the war. In addition, the population are unappreciative of the difficulties to be overcome, and particularly in connection with aerodromes seem to think that any piece of land will do, the uninitiated being inclined to think that the prickly cactus has an invigorating rather than an emaciating effect on the best Palmers. Fortunately the type of aerodrome met with in the Argentine, although not usually encouraging, generally does not lack in space.

However, a few months of active propaganda and a long series of brilliant flights by Major Kingsley in a D.H.4a when representing the late-lamented Aircraft Manufacturing Co. were the means of enabling him to sufficiently impress the public in order to float a small company.

This was done in July, 1919, and machines were immediately ordered from England, a staff selected, and the multifarious details of organisation necessary to the formation of an aviation company in a foreign country were carefully attended to. By December the machines arrived and serious work was commenced in January.

From this month until June 30th—that is six months—the following work has been done:—

| Pilot and Machines Used. | No. of Passengers. | Hours flown. | Milage (approx. |
|---|---|---|---|
| Major Kingsley (D.H.4a, 6 & 16) | 549 | 236.2 | 17,750 |
| Lieut. Thompson (D.H.6 & 16) | 181 | 61.1 | 3,985 |
| Capt. Colman (D.H.6) | 85 | 46.3 | 2,650 |
| Capt. Holland (D.H.6 & 16) | 7 | 12.45 | 731 |
| Lieut. Baker (D.H.6) | 506 | 134.15 | 7,124 |
| Lieut. Hassett (D.H.6) | 363 | 108.4 | 5,785 |
| Lieut. Mayne (D.H.6 & 16) | 312 | 69.1 | 4,081 |
| Lieut. Syddall (D.H.6) | 280 | 69.2 | 3,497 |
| Lieut. Sarniguet (D.H.6) | 7 | 1.2 | 76 |
| Lieut. Segui (D.H.6) | — | 1.1 | 65 |
| Totals | 2,290 | 740.4 | 45,744 |

These figures speak for themselves, especially when it is borne in mind that outside Buenos Aires there are only two aerodromes in the country. The company's mileage, flying hours, and passengers carried are increasing each month, and it is intended to issue fresh capital before the end of the year in order to start regular services even if, as it is expected, they have to be run at a loss for a considerable time.

At present there are 15 machines—12 D.H.6s, 2 D.H.16s, and 1 D.H.4a. Of these there are always five or six of the 6s touring all over the country, carrying passengers; the 16s and the 4a are kept at headquarters for doing long trips at short notice on receipt of order by telephone, telegraph or any other means.

The hangar, with its luxurious club at one end and its workshops at the other, is a very fine modern construction of brick and steel, with fireproof doors, electric power and light, telephones, etc., and the only one of its kind in the Argentine.

During a recent conversation with Major Kingsley he was asked his opinion in regard to the private ownership of small machines in this country and whether he found the market promising in this respect. In reply to this inquiry he stated that they had been able to sell a number of small machines, generally giving free instruction to the purchaser, but as there was so much war material for disposal from England, France, and Italy it was impossible to compete in price and at the same time give their customers the service compatible with the policy of the company; therefore it had been decided to devote temporarily only a small part of the company's energies to this branch and that they were not anxious to take up any new agency until either (1) the war stock had been very much depleted or (2) until someone built a machine so very much advanced on war designs that it would be possible to place it in the market at a price which would give a profit and at the same time render the service for which the company's installations are designed. That is to say, hold a large stock of spares, have the club, aerodrome and hangar space, workshops, mechanics and the car service at the customer's disposal.

Asked what he thought would be the requirements from the manufacturers he said: "Well, I won't say what would be the minimum requirements acceptable to us, but if anyone builds a machine complying with the majority of my specifications we would take it up, and I think I can safely say that with our organisation, resources, and reputation we could sell large quantities. The machine would have as many of the following points as possible:—

(1) A simple, reliable, water-cooled engine, 80 to 120 h.p., with a self-starter.
(2) Small span, not more than 38 ft. (monoplane, biplane or triplane), with if possible folding back wings.
(3) All metal, or as much as possible, with a minimum of external bracing.
(4) One pilot's and two side-by-side or slightly staggered passengers' seats.
(5) A light cabin over all three or at any rate the passenger seats, which could be either opened and closed or removed at will (not necessarily in the air, of course).
(6) A disappearing undercarriage if possible
(7) The whole not to weigh more than 1,800 lb.
(8) Price f.o.b. London not to exceed £900.
(9) Range of speed 30 to 80 m.p.h.

This may be a long way off; but it will come, and we can afford to wait, at any rate until most of the specifications are complied with.

Major Kingsley has been engaged on a business tour with the representatives of a leading brand of Argentine cigarettes. The distance to be covered was about 1,500 miles, a D.H.4a (375-h.p. Rolls-Royce "Eagle") being used. This form of propaganda is gaining popularity in the Argentine since the first flight to Brazil and back with some British bankers was accomplished successfully by the River Plate Aviation Co.—

"DUMSPIRAL."

## NORWAY.

A correspondent of THE AEROPLANE in Norway writes:—

### The Christiania Meeting.

The results of the various contests of the Christiania Winter Meeting, held from March 4th to 6th, are as follows:—

Handicap Flight (March 4th).—1, Mr. Lief Lier (Norway), Phœnix biplane, 109 min., 18.53 points; 2, Lt. von. Segebaden (Swedish Army), Phœnix biplane, 126 min., 21.42 points; 3, Lt. Thorsen (Norwegian Army), B.E.2, 231 min., 25.41 points; 4, Director Hellesen (Norway), Brandenberg biplane, 244 min., 41.48 points; Lt. Sjorholm (Swedish Army), Phœnix biplane, 269 min., 47.075 points.

Mr. Lief Lier obtained the first prize of 1,000 kr., the Goblet presented by the Department of Defence, and the Goblet presented by the Svenska Aeronautiska Sellskapet.

Triangular Flight (March 5th).—1, Lt. von Segebaden (Swedish Army), Phœnix biplane, 826.7 points; 2, Lt. Sjorholm (Swedish Army), Phœnix biplane, 776.92 points; 3, Lt. Gardin (Swedish Army), S18, 729.61 points; 4, Mr. Lief Lier (Norway), Phœnix biplane, 590-41 points; 5, Director Hellesen (Norway), Brandenberg biplane, 586 points; 6, Lt. Thorsen (Norwegian Army), B.E.2.

Lt. von Segebaden flew a distance of 765 km. in seven hours. He won the Goblet presented by the Norwegian pilots for the best Swedish pilot, and Lt. Thorsen won the Goblet presented by the Svenska Flygforbundets for the best Norwegian pilot. He will receive a special prize for the best performance on a machine under 100 h.p.

After performing so well in the previous days, Lt. von Segebaden was killed on the 6th, as has been previously reported in this paper, owing to the wing of his Phœnix biplane breaking during a stunting exhibition.—T. B. S.

# *AIRCRAFT IN PARLIAMENT*

### HOUSE OF COMMONS.

The following written answer was given on March 17th:—

### BRISTOL AEROPLANE COMPANY (CONTRACTS).

Mr. RENDALL asked the Secretary of State for Air whether the Government has any pending contracts with the Bristol Aeroplane Company; if so, for what total amount; and what, if any, subsidies or payments has this company received from the Government during 1920, or will receive during 1921?

Captain GUEST: I have been asked to reply. I would refer my hon. friend to the monthly *Labour Gazette* for information as to Air Ministry contracts placed from time to time. I am not in a position to give details of contracts not yet entered into. With regard to the last part of the question, no payment of the nature of a subsidy has been made to this company by the Air Ministry.

Mr. RENDALL asked the Secretary of State for Air whether, if the Bristol Aeroplane Company is employed on contracts for the Government, he will inquire whether there are many men at Filton, the seat of the company's works, formerly employed by the company now unemployed; whether the company has written recently to women formerly in its employ, who had regular employment elsewhere, asking them to return to the company for employment on Government contracts; whether many have in fact done so; and if this method of dealing with unemployment has his approval.

Captain GUEST: I have been asked to reply to this question, but I must point out that the fact of the Air Ministry being in contractual relations with a private firm does not make the Ministry responsible for the firm's conduct in such matters as those referred to in the question I have therefore not felt called upon to verify my hon. friend's suggestions, and am naturally not in a position to express approval or otherwise.

## THE ROYAL AERO CLUB.

### ANNUAL GENERAL MEETING.

The Annual General Meeting of the Members of the Royal Aero Club of the United Kingdom will be held on Wednesday, March 30th, 1921, at 3, Clifford Street, New Bond Street, London, W.1, at 6 p.m.

COMMITTEE.—The following Members have been nominated for election to the Committee:—Lieut.-Col. John D. Dunville, Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Lieut.-Col. F. K. McClean, D. C. MacLachlan, Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F., Flight Lieut. D. G. Murray, Viscount Northcliffe, Lieut.-Col. Alec Ogilvie, F. Handley Page, Rear-Admiral Sir Godfrey M. Paine, K.C.B., M.V.O., T. O. M. Sopwith, Viscount Tiverton.

### GREAT BRITAIN TO AUSTRALIA FLIGHT.

It has been decided to present the Gold Medals of the Club to Sir Ross Smith and Sir Keith Smith at the Annual General Meeting of the Club on Wednesday, March 30th, 1921, at 6 p m.

### FLYING SERVICES FUND COMMITTEE.

A Meeting of the Flying Services Fund Committee was held on Thursday last, March 17th, 1921, when there were present Squadron-Leader T. O'B. Hubbard, M.C., R.A.F., in the chair, Mr. Chester Fox and the Secretary.

APPLICATIONS FOR ASSISTANCE.—Thirty-eight applications for assistance were considered and Grants and Allowances were voted amounting to £140.

### JACQUES SCHNEIDER CUP.—SPECIAL REGULATIONS FOR 1921.

1. Clubs entering machines must deposit, in addition to the entry fee laid down in the General Regulations, a sum of 5,000 francs for each machine, as a guarantee of its being present for the contest.

This sum will be returned in respect of each machine that is present.

### WATER-TIGHTNESS AND NAVIGABILITY TESTS.

2. WATER-TIGHTNESS TEST.—The contest will begin with a test of the water-tightness of the floats, which will precede the Navigability Test.

For this test, the machines must be afloat for six hours, and during this time the floats must remain water-tight.

The machines must be in flying order, with or without the crew, and ready to start.

3. NAVIGABILITY TEST.—The Navigability Test will follow the Water-tightness Test. It will take place for all competitors on the same day or during the two days preceding the contest for the Cup, in the order drawn by lot.

The Commissaires Sportifs may allow competitors who have not passed the Navigability Test to make a second and final attempt immediately.

4. Each machine, in flying order, will cover in a closed circuit over the sea a distance of 5 to 10 sea miles. The exact distance will be fixed by the Commissaires Sportifs.

5. After taxying over the starting line, the machine must rise and continue the course in flight; during this flight the machine must be taxied over two distances of half mile the limits of which will be indicated by two buoys; it must then rise and complete the circuit, alighting again before the starting line, and taxying over.

Machines taking part in the Speed Contest must be in the same condition as for the Navigability Test.

Machines must not undergo any modification between the Navigability Test and the completion of the contest. Machines will be stamped to ensure this.

In the event of damage during the latter test, the necessary repairs may be carried out at sea, but these must not alter the original condition in which the machine was presented.

### SPEED TEST

The Jacques Schneider Cup in 1921 will be contested over a distance of 200 sea miles.

The contest will take place between June 15th and September 30th.

The order of starting will be drawn by lot.

Starts will be made at intervals fixed by the Commissaires

The contest will take place over the sea in a closed circuit of at least 5 sea miles.

The course may if necessary be taken over the coast, the controls being on land, care being taken to avoid all arrangements likely to impede the competitors.

Alightings are allowed. The start and finish will be in flight.

The contest will close at the time fixed by the Commissaires Sportifs.

The contest will take place at Venice on July 31st, 1921. Entries should be made to the Royal Aero Club not later than May 15th, 1921. Entrance Fee, £10.

### FLYING SERVICES FUND—SUBSCRIPTIONS.

Total Subscriptions received to February 21st, 1921, £17,205 3s. 1d.; S Brogdale, £2; Total, March 21st, 1921, £17,207 3s. 1d.

## R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

AIR MINISTRY, Feb. 15th.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—The notification in *Gazette* of Aug. 1st, 1919, appointing Major M. G. Lee to a permanent commn. is cancelled.

STORES BRANCH.—The following are granted permanent commns. as Flying Officers, retaining their present seniority:—P. F. Connaughton, W. A. Glasper, June 17th, 1920.

Flying Officer H. F. Webb is granted a permanent commn., retaining his present substantive rank and seniority, with effect from Sept. 12th, 1919, and is transferred to the Stores Branch, with effect from June 17th, 1920. The notification in *Gazette* of Sept. 12, 1919, appointing him to a short service commn., is cancelled.

Pilot Officer H. B. S. Ballantyne is granted a permanent commn. as a Flying Officer, with effect from and with seniority of Sept. 16th, 1919, and is transferred to the Stores Branch with effect from June 17th, 1920. The notification in *Gazette* of Sept. 16th, 1919, appointing him to a short service commn., is cancelled.

SHORT SERVICE COMMISSIONS.—The following are granted short service commns. in the ranks stated, with effect from the dates indicated, retaining their original seniority in the substantive rank last held prior to the grant of this commn., except where otherwise stated:—

Flying Officer from Flight Lt.—S. E. Adams, Jan. 31st.

Flying Officers.—B. M. T. S. Leete, Jan. 28th; J. W. Sole, Jan. 29th.

Flying Officer from Pilot Officer.—With effect from and with seniority of Feb. 2nd:—C. R. Stewart.

Flying Officer L. W. Mawbey relinquishes his short service commn. on account of ill-health contracted in the service, and is permitted to retain the rank of Lt., Jan. 8th.

Flight Lt. G. R. Hill resigns his short service commn., and is permitted to retain the rank of Capt., Feb. 17th.

Flying Officer J. H. Cooper resigns his short service commn., and is permitted to retain the rank of Lt., Feb. 1st.

Flying Officer Adams will be placed at the head of the list of Flying and Observer Officers, and will retain seniority relative to officers who have been similarly gazetted to short service commns. in a rank lower than their previous substantive rank, in accordance with his previous position on the gradation list.

FLYING BRANCH.—Pilot Officer (Hon. Flying Officer) F. C. de L. Kirk relinquishes his temp. commn. on return to Army duty, Oct. 26th, 1920 (substituted for the notification in the *Gazette* of Jan. 21st).

Flight Lt. B. U. S. Cripps, M.C. (Capt., Welch R.), relinquishes his temp. commn on return to Army duty, Jan. 31st.

Observer Officer A. Cox (Lt., R. Welch Fus.) relinquishes his temp. commn. on retirement from the Army, and is permitted to retain the rank of Lt., Feb. 17th.

AIR MINISTRY, Feb. 18th.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—The name of Sqdn. Ldr. Robert Hilton Jones, O.B.E., is as now described, and not as stated in *Gazette* of Aug. 22nd, 1919.

Flt. Lt. W. R. MacKenzie, D.F.C., is placed on half-pay, Scale B, from Feb. 9th to March 9th.

Flying Offr. E. E. Turner, D.F.C., is placed on half-pay, Scale B, from Feb. 5th to 11th

PROMOTIONS.—The name of Flying Offr. Herbert Bainbrigge Russell is as now described, and not as stated in *Gazette* of Dec. 31st, 1920.

MEMORANDA.—Lt.-Col. (actg. Brig.-Gen.) G. Livingston, C.M.G., relinquishes his temp. commn. on appointment to T.F. Reserve. The notification in *Gazette* of April 8th, 1919, stands.

Maj. (actg. Col.) C A J. Butter, O.B.E., relinquishes his temp. commn. on appt. to T.F., and is permitted to retain rank of Col.

## PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]

### DEATH.

COOPER.—On Sunday, March 13th, 1921, at 25, Thirlmere Road, Streatham, after a few days' illness, Flt. Sub-Lt. John Nichols (Jack), R.N., only son of Edward Foxen and Mary Cooper. Funeral at Putney Vale Cemetery to-morrow (Wednesday), at 12 o'clock.

### ENGAGEMENTS.

HAZELL—RIDDICK.—The engagement is announced between Flt. Lieut. T. F. Hazell, D.S.O., M.C., D.F.C., R.A.F., and Mab, only daughter of Mr. and Mrs. W. J. Riddick, of Cotelands, Buxton, Derbyshire, and Pen Aber, Criccieth.

JONES—WILSON.—The engagement is announced between Mr. Neville Jones (late Lieut., R.A.F.), eldest son of Richard Jones, of The Hermitage, Great Langhall, Cheshire, and Mary, the only daughter of Lieut.-Col. D Wilson, D.S.O., T.D., and Mrs. Wilson, of Whinthwaite, Levens, Westmorland.

STRAIN—HOWARD.—The engagement is announced between Laurence H. Strain, K.C., D.S.C. (late Lieut.-Col, R.A.F.), of 45, Heriot Row, Edinburgh, and Ellen Margaret, only daughter of the late A. H. Howard and Mrs. Howard, and niece of Mr. and Mrs. Henry Edmunds, of Moulsecombe Place, Brighton, where the marriage will take place.

### MARRIAGE.

ANDERSON—HOOD.—On March 18th, at St. Colomba's (Church of Scotland), Pont Street, S.W., Major N. Graeme Anderson, M.D., F.R.C.S, R.A.F., of 75, Harley Street, W., to Gladys, elder of Charles Hood, of Hatch End, Middlesex.

### BIRTHS.

EWEN.—On March 17th, at 27, Streathbourne Road, S.W.17, the wife of Major W. H. Ewen, R.A.F., of a daughter.

THOMPSON.—On Feb. 18th, at Shrewsbury, to the wife of Flying Officer A. E. Thompson, R.A.F., a son.

## EMPLOYMENT.

[Except where addresses are given, communications should be sent c/o THE AEROPLANE, 175, Piccadilly, W.1.]

Ex-Flight-Serjt. (No. 585), 9 years Balloon Section, R.E., R.F.C., and R A F Experience with most types of aircraft, Certified Ground Engineer (Rigging and Engines, Licence No. 454). Skilled mechanic (all types of cars, lorries, etc.), tester and driver, willing to go abroad if necessary. Out of employment.—L. F. Fagg, 11, Ship Street, Folkestone.

Licensed Ground Engineer seeks situation; 3½ years R.F.C. (N.C.O.). Licensed all single engined types, aeroplanes and seaplanes. Woodworker. Highest references. Home or abroad.—Edward Dunbar, P/A Repko, Van Ostadestraat 141 I, Amsterdam.

Fitter requires situation. Rolls-Royce, Siddeley "Puma," accustomed to Handley Page, Bristols, D.H.9, etc. Engineer's Licence, five years' aircraft, ten motor trade, held supervisory positions. Any country or period.—c/o Clarke, 70, Oakley Square, N.W.1.

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Edited by
A. J. SWINTON, (Late R.E.)

**THE AEROPLANE HANDBOOK is intended to provide a manual for the use of those who are engaged in the design, manufacture and use of aircraft.**

CONTENTS

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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... ... ... ... 291
Armstrong Siddeley Motors, Ltd. ... ... 285
Arrol-Johnston, Ltd. ... ... ... Front Cover
Auster, Ltd. ... ... ... ... ... Front Cover
Beardmore Aero Engines, Ltd., The Front Cover
Bowden Brake Co., Ltd., The ... ... ... 292
Bristol Aeroplane Co., Ltd. ... ... ... 276
Burlington Publishing Co., Ltd., The... ... 291
Cellon, Ltd. ... ... ... ... ... ... 285
Cunard Line ... ... ... ... ... ... 292
De Havilland Aircraft Co., Ltd., The... ... 276
Fairey Aviation Co., Ltd., The ... ... ... 271
Handley Page, Ltd. ... ... ... ... 281
Kodak, Ltd. ... ... ... ... ... ... 281
McGregor, Gow, & Holland, Ltd. ... ... 291
Metal Airscrew Co., Ltd. ... ... ... Front Cover
Napier, D., & Son, Ltd. ... ... ... ... 273
New Pegamoid, Ltd. ... ... ... ... 292
Nieuport and General Aircraft Co., Ltd. Back Cover
Roe, A. V., & Co., Ltd. ... ...Inside Front Cover
"Shell" Marketing Co. ... ... ... ... 279
Short Bros., Ltd. ... ... ... ... Back Cover
Titanine, Ltd. Front Cover & Inside Back Cover
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## ON CONTINENTAL AFFAIRS.

There are two ways of writing a book about a foreign country. One is to rush through the country in five minutes and then pretend to know all about it, the other is to live in it for ten years and pretend that one has merely a cursory acquaintance with the people and their problems. Either way is equally likely to be accurate. The five-minute visitor, as an absolute stranger, absorbs a few vivid impressions, and so does in fact get at the truth as far as he has seen it. The ten-year resident knows truly how little he knows. The dangerous man is he who has lived in a country long enough to have settled into a little groove of his own, but not long enough to realise how little his groove is in reality.

As one has recently made a rush through some small portions of France and Italy, and has seen a few people therein who are concerned with flying, it may perhaps be of interest to set down some of the impressions received, as indicating what is and what is not doing in those countries.

### France and the Helicopter Craze.

First of all, so far as France is concerned, the people who are interested in aviation chiefly as spectators, as distinct from those who are actively concerned in running useful air lines, seem to have gone crazy over helicopters. Every *fumiste* (which is good French for what we call a "hot air merchant") who can rig up a contraption of tubes or girders with a couple of airscrews working horizontally can get columns of notices in the French newspapers, and thence into the British and American newspapers, for the Anglo-Saxon correspondents in Paris seem just as cracked on the helicopter question as are the French newspaper men and Major-General Seely and some of our alleged technical people in this country.

There do, however, appear to be three fairly serious efforts to produce helicopters in the Latin countries. M. Louis Damblanc, who entertained the Royal Aeronatuical Society so highly a few months ago in London, has not been much in evidence of late, but one gathers that he is still working on the 300,000 francs allocated to him by his paternal Government.

The French Government is also said to be financing, or willing to finance, a gentleman named Pescara, who is busy agitating a couple of horizontal airscrews somewhere in Spain. It was announced in the Press with a great flourish of trumpets that our excellent friend Captain the Count Bernard de Romanet was to pilot the Pescara apparatus on a certain day. As a matter of fact Captain de Romanet proceeded to Spain, saw the apparatus, smiled his engaging smile at it and at a kinematograph camera specially engaged for the occasion, and came away, preferring wisely to fight another day with probably a more important enemy such, for example, as a real record-breaking flying machine. In any case there seems to be no danger of the Pescara apparatus flying for some time to come.

The third real live helicopter has been built by one Oehmichen—whether he pronounces himself O'Mikean or Omission one does not pretend to know. It was illustrated in The Aeroplane recently, and that is about as far as it has attained towards permanent fame. The girders and airscrews have a small sausage-balloon above them which is not big enough to lift them, but is enough to lift a portion of their weight and to prevent them from falling over sideways when the screws push the rest of the weight off the ground.

What the thing proves and why anybody should spend money on it is not very clear. Mr. Ernest Willows proved as much with his swivelling airscrews on his little balloon in 1909. He could get off the ground quite well when the total weight of his ship was more than the balloon would lift. In the ensuing twelve years Mr. Oehmichen has been able to procure more efficient airscrews, though his engine is no more powerful for its weight, and so far as one can discover that explains why he lifts more per horse-power than Mr. Willows did. And, be it remembered, Mr. Willows was merely trying to make a balloon easily manœuvrable. He did not pretend to be making a helicopter.

Personally one has no use for helicopters, and regards them simply as a waste of time and money. By the time the helicopter people have made one of their contraptions into a real flying machine, the genuine aeroplane people will be achieving far better results in a much simpler and safer and more efficient way.

There is no real difficulty in getting off the ground helicopter-fashion. Several modern aeroplanes will hang on their airscrews without descending, so long as their engines keep going. The trouble with the helicopter is to get down safely if the engine stops. And that is just what the aeroplane can do.

### The French Press and the Aircraft Industry.

Meantime the newspapers in France gush over helicopters while their aeroplane manufacturers, who are really doing good work, have to pay a good stiff price per line if they want their machines or their work mentioned at all. Such is the custom of the French Press.

One excepts from this condemnation that excellent paper *L'Air*, which is run on the lines of an English paper, and mentions everybody and everything according to merit or news value and not according to length or depth of purse. Unfortunately one missed seeing M. Roche d'Estrez, the able and amicable *redacteur-en-chef*, or, as we should say, editor, of *L'Air*, but one had an interesting talk with a member of his staff, who was very distinctly optimistic about the state of French aviation.

He had good reason to be so, seeing that French transport firms with French machines have been carrying all the cross-Channel air mails for several weeks, and have so much parcel traffic besides that they cannot handle it. A glance at the Air Port traffic lists in The Aeroplane during the past couple of months is enough to confirm French optimism.

Over and above this the assistant editor of *L'Air* said that the best French aircraft firms are employed—if not busy—on building aeroplanes for both the French Services and for foreign countries. He admitted that the total orders were small, when compared with war orders, but, as he put it with that gentle cynicism which is so French, the Aircraft Industry is in a better position than the Motor Industry, which has no orders at all. Which is, in fact, precisely the position in this country.

### Flying on the Riviera.

While, according to the book regular air traffic has been going on in the cold and misty North, there seems to be hardly anything doing in the South, where one would expect it. Along the Riviera itself one could only locate three machines. Our old friend Laurence Santoni, now located in Paris, has a Savoia at Antibes, piloted by that very capable and charming Italian aviator Colombo. It did not appear during the three weeks of one's stay in the South, chiefly because Colombo was at home in Italy most of the time. Also it was blowing a whole gale from the North for a week on end, and the sea, though blue and sunny, was full of white caps, and would have been dangerous for anything smaller than a Porte boat.

At that appalling little gravel-patch near Nice known as the Aerodrome de Californie Maicon has some aged Caudrons which on fine days give the *baptême de l'air* to the ambitious, and make the *tourisme aérienne* for those who know little of modern aeroplanes. They evolute over the Promenade des Anglais and make so much noise that one cannot even hear the war and peace profiteers in the hotels across the road eating their soup.

In a corner of the harbour at Monaco lurks a Maurice Farman of amazing antiquity, looking as if it had been left behind by the Meeting of Hydravions in 1913 Probably it is not really quite as old as that, but it is of that type. It belongs to a sportsman named Lallouette, and takes up passengers who have either been made reckless by their winnings or been driven to despair in the Casino on the Hill of Charles above the harbour. Lallouette gets off from and alights in the harbour, which is about 2 × 4. What would happen to the dear old chicken-run if it alighted on a ripple in the open sea one trembles to imagine. But judging by the huge amount of work it does on fine days it is capable of going on for ever under present conditions.

That was all the flying to be discovered on the Riviera, except that one day an Italian flying boat came down from Savona or San Remo or somewhere that way. It hurtled round the Casino and the Prince's Palace, where the newly christened son of the Prince's grand-daughter, the Duchesse de Valentinois, and of Pierre Grimaldi (*né* Prince de Polignac) her husband must have been seriously perturbed, and after doing violent and apparently contemptuous banked turns over the town fled rapidly back to Italy. It was a very pretty show while it lasted, and must have conveyed the idea that the Italians can fly, as indeed they can.

## A Visit to Italy.

Thence we (Herself and oneself) proceeded to Milan, at the impressed commands of one Mario Arioli, who will be remembered by many of the old-timers in this country as the bosom friend of the late and ever-to-be-lamented "Benny" Hucks, and his companion on many of those valuable pioneering tours which that excellent pilot made in the West Country and in South Wales. Arioli, after doing good work in the war, settled down to make magnetos in Milan, and is now a personage of importance in Italian automobilism, but he still retains a keen interest in aviation.

Unfortunately, during our brief stay in Milan it was impossible to see the Cavalliere Luigi Mapelli, chief of the S.A.I.A.M. (Societa Anonima Imprese Aeree de Milano), donor of the Mapelli Cup for small aeroplanes and the great apostle of Civil Aviation in Italy. But one heard much of the excellent work which the Cavalliere Mapelli is doing in awakening the Italian Government to the importance of Civil Aviation and the needs thereof. His policy includes the establishment of adequate landing grounds, the provision of proper lighting and signalling services, and all the other necessary accompaniments of aviation.

Certainly there are great opportunities for aviation in Italy despite its mountainous topography. Its railways are approximately the worst and slowest in the world, and its enormous coastline indented with splendid bays and harbours simply clamours for flying-boat services. Which is probably why Italy excels in the building of flying-boats. Also the magnificent climate probably accounts for the fact that the majority of these craft are better suited for smooth water than for rough.

One hopes that the Cavalliere Mapelli may succeed in his efforts to spread the Gospel of Aviation. And one wishes that we had in this country a similarly keen sportsman who would likewise spend his private fortune in so useful a manner.

## The Capronissimo Mystery.

Signor Arioli's prime reason for commanding our presence in Italy was that we might see the evolutions of the giant Caproni triplane (or 9-plane) on Lake Maggiore. In his luxurious Diatto automobile he took us at vertiginous speed round the cliff-corners of Lake Como, just to show how beautiful it would be to fly over the lake, and thence we progressed via Varese to Lake Maggiore. But, alas! when we arrived the giant Caproni was rather under the lake than on it.

The fate of the Caproni is wrapped in mystery. According to the official account in the Italian papers the machine (which was illustrated and described in THE AEROPLANE of March 16th) made a flight of a mile, and on descending was damaged so that she was retired for a *piccolo riparazzione*. Judging by the wreckage which one saw, there would not be much *piccolo* about the reparations.

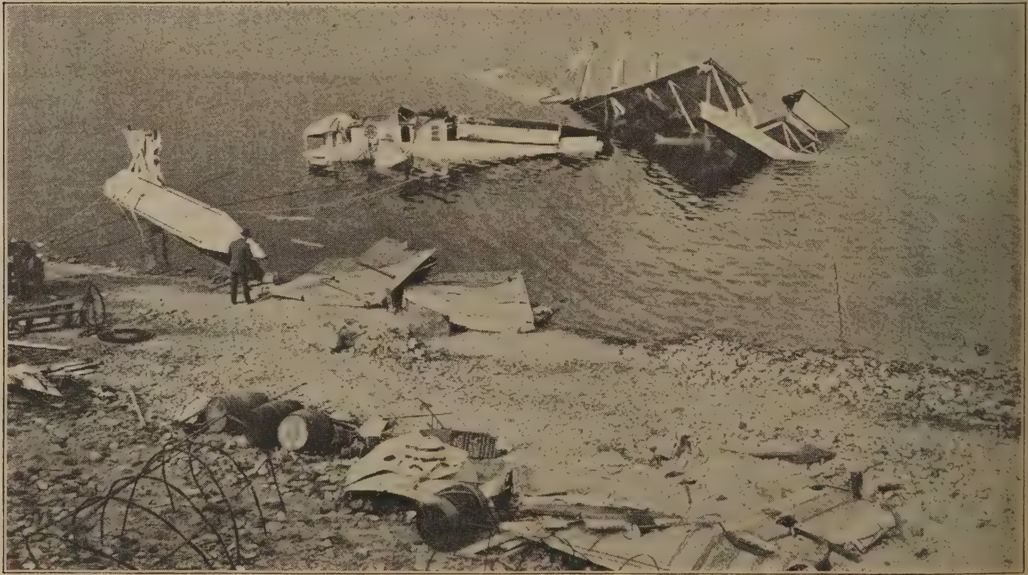
The other story was that the wreckage did not belong to the "9-plane 8-engine" apparatus, but to another machine, an ordinary triplane on floats, which about the same time made a complete submersion. Yet somehow the bits and pieces which were in the water and distributed along the shore near Arona were so exactly like corresponding pieces of the big machine as she appears in the photograph that it is hard to believe that they belonged to another aeroplane.

We in this country are not free from euphemisms similar to the *piccolo riparazzione* phrase. One remembers an aviator who was reported as having "discontinued his flight" after landing directly on his engine, and of another who came down "with one cylinder missing," the cylinder having disappeared entirely in the air. So perhaps after all the "little repairs" may take a few months.

The unofficial report is that the pilot Sembrini, a very good and experienced aviator, took the machine off the water, got her up to about 60 feet, and that then she gently put her nose down and continued so till she drove it under water. Considering that she had four Liberty engines on her forward planes and four more aft, with very small elevators and yards of space between the engine-masses, it must have been very difficult to counteract her enormous longitudinal moment of inertia, and so the story has every semblance of truth.

It was said that she had several tons of ballast on board and that the ballast shifted. But her longitudinal moment would account for the affair without having to import the ballast as an explanation.

Howbeit, the portable airship shed in which she had been housed on the shore near Sesto Calende was religiously closed and wore a look of mourning. A Liberty engine wrapped in bits of a nacelle sat in a barge near it. And the Savoia workmen, who live and have their being within sight of the aforesaid shed were quite definite in their story of the accident,



**A "PICCOLO RIPARAZZIONE."—The wreck of the "Capronissimo" in Lake Maggiore. On the left is one of the four fuselages. The great cabin-boat hull apparently broke amidships, and the upper part of the forward half is seen here. Part of the middle plane of the central triplane is seen with a wing float attached, and behind it is a piece of another fuselage. On the beach are seen a few acres of broken planes and in the middle foreground is an engine cowl.**

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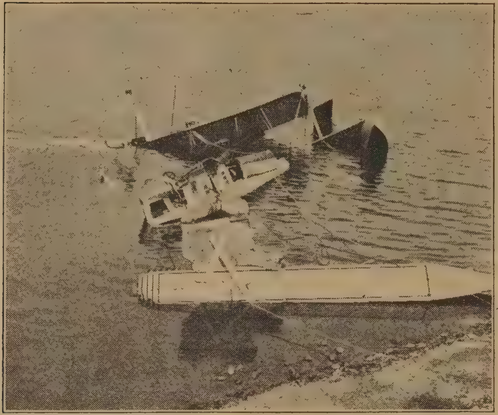

The wreck of the "Capronissimo" at a different angle. Here may be seen the exhaust pipes of one side of a Liberty engine projecting from the fore part of the fuselage, to which are attached two struts of a piece of a plane. The wing float is seen to be close to the boat-hull.

so although they belong to a rival firm in a country where party feeling runs high, one feels inclined to believe the substance of their story, even though one may not believe the additional and often contradictory details, as, for example, that some of the wing structure collapsed when the pilot endeavoured to pull the machine out of her dive.

At any rate, the giant was a fine effort to build a big machine. And useful knowledge must have been gained. And the good Sembrini survives to tell all the interesting and essential and valuable facts to the Ingeniere Caproni, even if nobody else ever learns the inside history of what happened.

### The Successful Savoia.

At Sesto Calende we were met and conducted round the Savoia works by the Commendatore Odierno, the famous motor-boat designer, who co-operates with Signor Capé of the Savoia firm, and by Signor Conflenti ,the firm's aerodynamic expert, who will be remembered by many who met him during the Royal Aero Club's fiasco at Bournemouth, when Janello removed the Schneider Cup to Italy, where it remains.

The Savoia people are in the happy position of having quite a large number of their excellent S.16 flying-boats, with Isotta-Fraschini engines, on order for the Italian Navy. Also they have other orders from sundry foreign Powers.

We were shown, under pledge of secrecy as to details, two very interesting boats in process of construction for the Schneider Cup race this year. One is a tiny single-engined boat, much smaller than that which appeared at Bournemouth. It has a span of about 15 *feet* and a huge engine. The other is a boat with wings of 17 *metres* span, and two big engines in tandem, one with a tractor and one with a pusher screw, which may be an inefficient arrangement, but seems to be the only way of absorbing the power of the two engines, seeing that the diameter of the screws is limited by the height of the engines above the hull of the boat. Both boats are, as with all Savoias, beautiful examples of the work of artist-artisans. There was also a big boat with a 700-h.p. Fiat engine, whose performances ought to be worth watching. Altogether the Savoia Works are a very fine affair. One desires to express herewith to the Commendatore Odierno our thanks for his many kindnesses and courtesies, and one wishes him and the Savoia firm good fortune in the future.

### The Macchi Firm.

By bad luck we came through Varese and past the Macchi Works just when everyone had gone. This firm, which has made many remarkably fine boats as well as land-going aeroplanes also appears to be quite busy on work of various kinds. Perhaps at some future date one may have the good fortune to see the inside of the works as well as the outside.

### Italy in General.

Meantime it is good to know that our old Allies the Italians are by no means so badly off as common talk would have one believe. Of course trade is bad. It is bad everywhere. But the Italian people look well fed and happy. And the rows between Communists and Fascisti seem negligible.

Italy is a land of faction-fights, just like Ireland. Communists and Fascisti only amount to Guelphs and Ghibellines, or Reds and Blues, or any other factions, and the Fascisti (who fought in the war) always seem able to knock the stuffing out of the Communists (who did not), and that in itself is the best guarantee of the future good of Italy, a delightful country full of charming people who are so very like the Irish that we felt very much at home with them.

It may be of interest to British workmen to learn that Italy, a nation of wonderful craftsmen who love their work for the work's sake, but a country without a pound of coal to be mined within her frontiers, is now buying her coal from Germany. Italy's coal used to be sea-borne from England.

As we waited for the Orient Express to take us home a train of nearly a hundred empty coal-trucks, each capable of carrying 20 tons (20,000 kilos), went past us towards the North, and every truck was bound for Essen to fetch more coal. With British coal and the wages of British colliers at their present absurd figure, and with the Italian lira at 100 or more to the £1, the Italians would be fools to buy British coal when German colliers really work and German coal-owners sell at a reasonable price and an Italian lira is worth 2½ German marks or thereabouts. So the next time we are beaten by an Italian machine in a big aeroplane race we may reflect that the machine and its engine were probably built with the help of German coal, whereas but for our insular greed we might at least have contributed that much towards our own defeat.

In Italy as in France, and as in England, the Aircraft Industry is feeling a trifle more cheerful than is the Motor Trade, or at any rate it is not quite so downhearted. Which is a happy augury for the future of International Aviation.

C. G. G.

## PARLIAMENTARY NOTES.

When the House of Commons was adjourned on Tuesday, March 22nd, 1921, on the proposal for the Second Reading of the Consolidated Fund (No. 2) Bill Honourable Members, as is customary, raised any subject which they desired. Sir W. Joynson-Hicks, true to his principles, burst into Civil Aviation late in the proceedings.

He wished to have information on two points. Firstly, the progress of civil aviation, and secondly the present position in regard to airships. How was the £60,000 for subsidies to be expended? The French had set aside 33,000,000 francs for this purpose and allowed those who had served as French military aviators to use on certain days of the week French military aerodromes with freedom to fly Government aeroplanes at no cost to themselves. He thought a re-arrangement of the Air Estimates would make it possible to set aside £150,000 or £200,000 for civil aviation.

In regard to airships he was strongly against the present policy of inaction. He could see no reason why £250,000 a year for the next two years should not be set aside for the maintenance of airships and the continuance of experiments. Some of the £3,250,000 to be spent on bricks and mortar—superfluous in the view of the omniscient knight—might be re-allocated for airship work.

Major-General Seely followed in the debate and spoke his part once again.

Captain Guest (Joint Parliamentary Secretary to the Treasury) replied for the Air Ministry. So far as airships are concerned he said little to which objection could be taken. The costly nature of the lighter-than-air flying justified in these hard times the reduction in charges for this purpose.

He said that the present arrangement in regard to the London-Paris Service was purely temporary, and that the two firms engaged had for patriotic reasons entered into a tentative agreement. The contracts were as yet unsigned, but it was hoped that the service might continue throughout the summer. Substantial Government grants will be given during the next few years for cross-Channel air services.

He did not think it proper to compare our subsidies with those of the French. "For instance, the French system of paying subsidies is rapidly tending towards a French nationalised civil aviation service, in which you will find that the word 'civil' will eventually drop out and the word 'military' take its place.

Several tentative offers to take over the airships have recently been received.

## INTER-ALLIED COMMISSION AND GERMANY.

The following paragraph appeared in the Press on March 29th :—

Berlin, March 28th.—Replying to a note from the Inter-Allied Aeronautical Control Commission of March 17th asking whether manufacturers of aeronautical material are still supported by the German Government in their continued violation of the Entente's Boulogne decisions, the German Government states that it still adheres to its standpoint that the Versailles Treaty does not give the Allies the right to prolong the embargo on the manufacture and importation of aeronautical material beyond July 10th, 1920, and proposes that the matter be referred to arbitration.

# SIR ROSS SMITH

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the first to fly to Australia, says of the

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"When we left Surabaya to start for Australia, we knew that ahead of us were 500 miles of open sea and **the one thing that backed me up was** that I happened to have this "Vimy" with **two Rolls-Royce engines, which just two months before had flown across the wide sweep of the Atlantic**, and when I thought of what poor Alcock had gone through our flight seemed only a joyride."

"**The engines**, beyond the usual cleaning and adjusting, **had practically nothing done to them the whole time.** We would willingly, on reaching Port Darwin, have turned round and flown back."

"We were so confident in the ability of the machine that we simply went ahead in perfect confidence."

"**A Rolls-Royce engine, properly looked after, would carry an aeroplane anywhere. The engines were the finest it was possible to have.**"

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# EASTER SUNDAY AND A DE HAVILLAND.

On Saturday evening at Croydon, after the flying was over, we—that is to say, Mr. Ortweiler, Mr. Rupert Waring (who did not, etc.), and myself—were sitting in the lounge of the Trust House discussing the question of going away for Easter. We had already sampled the trains and did not think that standing in a stuffy railway carriage for two-and-a-half hours was good enough, and the roads were as the roads are.

We thereupon came to the conclusion that the only way to go was by air. Knowing the go-ahead reputation of the De Havilland Aircraft Company and also the fact that Mr. Ortweiler had been flying their machines recently, I got on the 'phone to Capt. Geoffrey de Havilland and explained our position, and, after consulting Mr. Walker, he readily put a D.H.9 at our disposal.

We arranged that Mr. Ortweiler, who lives in North London, should fetch the machine from Stag Lane Aerodrome and pick us up at our "home-town" aerodrome, which is Croydon, about midday. However, as the light was so good, Mr. Ortweiler decide to pick up a photographer from Aerofilms, Ltd., and get some photographs of London on the way over. This delayed him a few minutes, and we finally got off the ground at Croydon at 12.15, with a good following wind, and headed for Eastbourne.

We passed over Kenley, and as there was a 30-knot breeze blowing we got a rough time over the Caterham Valley. Soon after passing over Edenbridge (the name of which is written very prominently in white chalk in a field by the railway station for the benefit of those using the Continental air route) we sighted the sea, and following the railway line we reached Herstmonceux Castle after 12 minutes' flying. Coming down low we flew round about to get a good view of the place, which looks very fine from the air.

We then made off to Eastbourne, where we had a lunch appointment at 13.30, and after flying along the front as far as the Grand Hotel we made the aerodrome.

Having been previously warned as to its dangerous condition we flew warily over it and found that the boarding which covered the irrigation ditches had been removed and that nowhere was there a run of more than 150 yards or so.

However, Mr. Ortweiler, having previously taken a compass bearing of the direction of the wind, brought the D.H.9 in low over St. Anthony's Hill and pulled her up in about 50 yards. Quite one of the best performances seen.

Here we left the machine, and availing ourselves of a lift in a friendly motor-car we arrived at the Grand Hotel within 40 minutes of leaving Croydon.

After spending some time with friends in Eastbourne, we seized two taxis and, complete with a bevy of beauty, we returned to the aerodrome. The "Puma" engine started at first pull-over and at 16.45 we cleared the ground with plenty of room to spare. After a dive at our waiting friends and flying up the front once more, we kindly north again; this time the wind, which had kindly dropped in strength, was in our teeth. Before leaving we discovered that an enclosure behind the old seaplane sheds solves the mystery of where the bathing machines go in the winter time.

Visibility was so good that we could see the Crystal Palace from over Polegate.

When over Edenbridge again, we could clearly see the lighthouse at Croydon, even though the sun had not yet set.

Mr. Ortweiler kept the engine well throttled down the whole way back as we had plenty of time and there was no need to hurry. We reached Croydon after about 40 minutes' flying and made a perfect landing, after which Mr. Ortweiler took the machine back to Stag Lane, the private De Havilland aerodrome.

I always looked upon Eastbourne as a place some two-and-a-half hours distant from London, but thanks to the De Havilland Aircraft Company, I can now never regard it as place not more than half-a-hour away at the most, to which anyone can go, merely to lunch, with the greatest of ease.—G. D.

# OFFICIAL AVIATION IN CHINA.

Lieut.-Col. F. V. Holt, R.A.F., D.S.O., technical adviser to the Aeronautical Department of the Chinese Government, spoke on "Recent Developments in Aviation in North China and the Peking-Shanghai Line" before a meeting convened by the Pan-Pacific Association and the Aero Club of Shanghai on Jan. 18th.

He outlined the history of aviation in China from its early beginnings to the present day. In 1913, consequent on the successful flights of Vallon, Z. Y. Lee, Feng Yu, and Tom Gunn, "the Chinese General Staff started a flying school in Nanyuan which was equipped and run by the French. They started with twelve Caudron biplanes and the necessary workshops."

With two French pilots and two French mechanics, over 100 pilots were trained up to the pre-war standard of certificate. The machines were so well maintained that many of them were still fit to fly in 1920.

In 1919 contracts were placed with British firms by the two departments responsible for aviation in China. The Aeronautical Bureau of the Board of Communications, through General Ting Shih-yuan, bought six Handley Page biplanes, and the Aeronautical Department under General Tinn Kinn bought 150 aeroplanes, training and commercial, from Vickers, Ltd., and obtained ground staff through the same firm. The latter Department also raised a loan of £500,000 to cover the cost of ground establishments.

In the summer of 1920 the fall of the Anfu party made it possible to abolish the Aeronautical Bureau of the Board of Communications, leaving the control of aviation in the hands of General Tinn Kinn, who left the War Department to take undivided charge of the Aviation Department. He is directly responsible to the Cabinet.

During the autumn of 1920 life was unpleasant, as the only training aerodrome was occupied by a hostile division, all aeronautical stores were held up at the ports, and financial trouble had stopped the supply of money to the Department.

Since then the conditions have improved. Flying training has begun again at Nanyuan, south of Peking. A new flying training establishment is being equipped at Tsing Ho, north-west of Peking.

Some of the machines recently annexed by the Tuchuns during the summer fighting have been returned and the rest are expected shortly.

China has signed the International Air Convention, and the regulations for bringing it into force are shortly to be issued.

Aeronautical material has now been brought to Peking from the ports, a small proportion of which has suffered from exposure on wharves during the summer of 1920

By the end of 1921 there should be a good number of well-trained Chinese pilots, and the progress of mechanics is promising, though natural carelessness has to be overcome by continued training.

The Chinese Central Government for political and financial reasons cannot develop either a Military or Naval Air Service, and has decided to concentrate on the development of a Government commercial air service. This is an experiment tried by no other Government.

# THE ROYAL AIR FORCE DISPLAY AT HELIOPOLIS.

On March 3rd and 4th last an aerial display in aid of the Royal Air Force Memorial Fund was given at Heliopolis by personnel of the Royal Air Force units in Egypt and Palestine. The arrangements were made in a large degree by Air Commodore Oliver Swann, C.B., C.B.E., whose energy and attention to detail made a great success of the entire pageant.

There were eleven events on each day ranging from "formation flying" to "aerobatics" and "laying a smoke screen." The machines used were Bristol "Fighters," D.H.9as and D.H.10s, and Sopwith "Snipes."

Each afternoon passenger flights were given in multi-seater and two-seater machines at reasonable prices. There were so many people anxious to fly that booking had to be stopped at 4.15 p.m. on the first day, and additional machines had to be devoted to passenger flying on the second day.

An excellent programme was issued giving full detail as to the happenings of the two days.

No accident marred the proceedings and so ended all things happily.

# THE DEATH OF LIEUT. MCINTOSH.

Information has been received from Perth, W.A., of a fatal accident to Lieut. McIntosh, A.F.C., who, together with Lieut. Parer, completed one of the finest flights in the history of aeronautics, by flying from Hounslow to Melbourne on a D.H.9.

The accident occurred at Pithara, a small mining township about 300 miles N.W. of Perth, but beyond the facts that both he and his mechanic were killed and their passenger was injured, and that it is presumed that engine trouble was the cause of the accident, very little is known of the affair.

Again, the peculiarities of journalism are shown, by the fact that the death of this plucky aviator has drawn forth in one day more praise and information of the extraordinary flight than appeared either at the commencement, the termination, or even during the whole of the six months' flight.

Lieut. McIntosh acted primarily as navigator, but also as reserve pilot, mechanic, etc., as necessity arose, but whatever purpose he fulfilled, equal credit is due to him for the tenacity of purpose and indomitable pluck that enabled the little expedition to pull through successfully despite all trials and delays encountered *en route*.

That he and Mr. Parer should have succeeded without any outside financial assistance, and on a disposal war machine, adds considerably to their accomplishment.—L. B.

# NAVAL AND MILITARY AERONAUTICS.

## GREAT BRITAIN.

### The R.A.F. Territorial Reserve.

The following letter has been received and is printed with comments interpolated in brackets :—

Sir,—For some considerable time past—and particularly during the last week—the daily newspapers have been devoting space to alleged news relating to the formation of what they describe as "the Territorial Air Force." It is also commonly stated that the formation of this force will be undertaken, or is actually being undertaken, by Territorial Force Associations.

Assuming that these paragraphs are more or less correct, it is difficult to understand why this branch of the R.A.F. should be labelled "territorial," and it is even more difficult to understand what Territorial Force Associations, which have hitherto been purely Army organisations, have got to do with the Royal Air Force.

[The paragraphs are incorrect in that there is no possibility of forming a T.F., R.A.F., this year for the good reason that there is no money available with which to raise it. The Air Force Vote is insufficient to pay for the immediate needs of the R.A.F. Regular Land and Sea-going units. The proposed force, when raised, must be raised locally, and thus must be formed on a territorial basis, each unit belonging to its own territory. The Territorial Force Association having all the organisation ready to hand for the work of raising such units can do the work at much less expense than could a new and rival R.A.F. Association.—Ed.]

Rightly or wrongly, the country, or rather its rulers, have decided upon a separate Air Service. Having made the decision, it would seem advisable to do one of two things, either to stick to it, or else to reverse it as quickly as possible. But there can be no case whatsoever for the curious policy of mixing up the R.A.F. with the Army that has been more or less in evidence ever since All Fool's Day, 1918.

[The reason is the very good one that the Army is still at war in many different areas in the Middle East, and needs the R.A.F. to work with it. Therefore, to assure efficient cooperation the two Services must be very closely interconnected.—Ed.]

The pursuance of this policy on the part of those in authority may or may not be intentional, but it has a very apparent existence. This matter of the "territorial" Air Force is a case in point, as also is the formation of the Army Dental Corps, to look after the teeth of soldiers and airmen jointly. It is very keenly resented by a considerable proportion of the R.A.F., and not by any means exclusively by the ex-Naval element.

[The R.A.F., with its present meagre Vote, cannot afford a Dental Corps of its own. The R.A.F. Medical Corps is largely of the Army also. Nobody who has had any experience of the average Naval "farrier" would wish it to be otherwise.—Ed.]

The word "territorial" is associated, in the minds of the public, exclusively with soldiers. The word "volunteer," and likewise the word "reserve," are common to both the Navy and the Army. One or other of these latter ought to be applied to the new branch of the R.A.F., whenever it comes into being. Or, failing that, it would really be better to invent a new word altogether, however comic, than to perpetuate a very detrimental heresy.

(Signed) L. FRANCIS JONES

Kensington, W. Jan. 22nd. (late R.F.C. and R.A.F.).

[The R.A.F. Reserve is a thing already in being and existed before the war, and the first four squadrons consisted largely of Reserve officers. The Navy has the R.N.V.R. which corresponds to the T.F. of the Army but is not organised on a territorial basis. It might be possible to call the T.F., R.A.F., the R.A.F. Territorial Reserve, to avoid confusion with the Territorial Force of the Army. As the proposed new section of the R.A.F. does not exist and has not been given an official name one offers the suggestion for what it is worth.—Ed.]

### 45 Squadron Dinner.

It is proposed to hold a reunion dinner on April 9th of all officers who served in 45 Squadron (R.F.C. and R.A.F.) during the war. Will all interested or desirous of attending please communicate with John Firth, Ivy House, Barnby Moor, Retford?

### The Ross Smith Travelogue.

In connection with the special matinées to be given at most theatres and places of public amusement on Friday, April 1st, in aid of Lord Haig's Warriors' Day Fund, it has been announced that Sir Ross Smith has decided to devote the proceeds of Friday's matinée to the above fund.

The occasion therefore seems to be very suitable to all to visit, or re-visit, the Philharmonic Hall on that day, when one feels sure that they will not be disappointed, and at the same time will know that they are benefiting one of the most deserving of charities.

## GERMANY.

The Danish correspondent of THE AEROPLANE writes :—

### Information Wanted.

A British advertisement appeared in *Flugsport* some time ago, which reads in translation as follows :—

"Who knows the burying place of the English Flight Lieut. Herbert John Green, Royal Flying Corps, and of his observer Lieut. Ried, Royal Flying Corps? They were shot down by German pilots on Saturday morning, March 3rd, 1917, at Bois Bernard, near Henin Lietard, in France. They were flying a Sopwith two-seater, No. 1108. As the machine was not burnt, and the German War Office, via Switzerland,, sent the personal effects left to the relatives, the latter presume that they were buried, to all likelihood, by the Jadstaffel Richthofen that was then stationed in Douai. The relatives earnestly request that any information may be sent to the 'Pilot, Research Section,' of *Flugsport*, 8, Bahnhofsplatz, Frankfort-on-Main."

### Rewards for Airship Personnel.

The Naval Regulation Paper announces that to maintain the recollection in the German people of the performances of the now dissolved Army Airship Department and of the Naval Airship Section, now being dissolved, a memory sign will be issued, upon request, to all active, inactive and resigned officers, deck officers and crews, who served for at least one year on an airship at active service.—E. H.

### U.S. Army Fatality in Germany.

On Jan. 28th, Lieut. C. M. Cutler was killed and Lieut. C. P. Dorland was seriously injured in an accident that occurred near Weissenthurm, Germany, owing to their D.H.4B, on which Lieut. Cutler was instructing Lieut. Dorland, falling 400 ft., for some unknown reason, into a newly-ploughed field at Irlich. Both officers belonged to the U.S. Army Air Detachment operating with the American Army of Occupation.

## ITALY.

The Italian correspondent of THE AEROPLANE writes :—

### Fast Flying-Boats Taken Over.

On Jan. 7th the Italian Naval Authorities, represented by Comdr. Righini, took delivery of several Savoia 12 seaplanes which had been previously tested on Lake Maggiore. The machines during the tests developed 222 km. per hour and climbed 4,000 metres in 21 min. with full load.

### Civil and Service Aeronautics Severed.

The total severance of Military Aviation from Civil institutions of the kind and its attachment to and dependence from the General H.Q. Staff at the War Office is announced.—T. S. H.

## JAPAN.

A Japanese correspondent of THE AEROPLANE writes :—

### An Across Main-Land Flight by Naval Aviators.

On Nov. 4th, three Naval aviators, flying Kaigunshiki seaplanes (made by Imp. Yokoshuka Dockyard, 200-h.p. Hispano-Suiza motored) left Oppama Aerial Station, near Yokosuka, for Shinmaizuru, across the Bay of Ise and over Mount Suzuka, one of the highest mountains in Western Japan and Lake Biwa. The distance is about 300 miles and each machine carried one passenger. Shinmaizuru was safely reached on the same afternoon. The return flight from Shinmaizuru to Oppama started on the morning of Nov. 7th, and all the machines arrived safely to Oppama.

### New Looping Record.

On Nov. 10th, Capt. Kozeki, one of the well-known army flyers, set up a remarkable new record of looping the loop flight, in the sky over Tokorozawa aerodrome. He looped 126 times in 20 minutes, in a Sopwith (100-h.p. Le Rhone) single-seat biplane.—N. K.

* * *

## A MARKET FOR BRITISH AIRCRAFT.

One is informed that the Republic of Honduras is in the market at present for ten modern two-place fighting machines and fifteen training machines. The Chief of Aviation in that country wishes to get into direct communication with British manufacturers who are prepared to negotiate the sale of such machines. It is probable that apart from these war machines there will soon be a market also for several large passenger and freight carrying machines. Letters addressed to Mr. D. Ivan Lamb, c/o THE AEROPLANE, will be forwarded to the right quarter.

## AN APOLOGY.

Owing to an unfortunate editorial omission THE AEROPLANE owes an apology to our late enemies, the German army. The aerial picture of Heliopolis published on page 272 of THE AEROPLANE, March 23rd, was in fact taken during the war by a German aviator flying over our chief air station in Egypt, and was reproduced from a German paper, *Der Motor*. One has pleasure in making these acknowledgments.

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# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

It having become evident that the Government propose to set seriously about the task of assisting Commercial Aviation, it becomes important to consider in what manner such assistance may be best applied. In an article below Capt. Sayers discusses this question with a particular view to the importance of providing the strongest possible incentive to progress in the design and construction of aeroplanes.

A Committee has been appointed by the Royal Aeronautical Society to discuss the design of aero-engines and dispositions needed to secure safe and economical operation of commercial aircraft. The composition and the terms of reference of this committee, together with certain comments thereon, appear on page 304.

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The first British airship to be properly equipped for the carriage of passengers—G-FAAF, otherwise R36—is described in this issue. (Page 308.)

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A note as to the work and objects of the American equivalent of the British R.A.E. appears on page 310.

## HOW TO RE-ESTABLISH THE AIRCRAFT INDUSTRY.

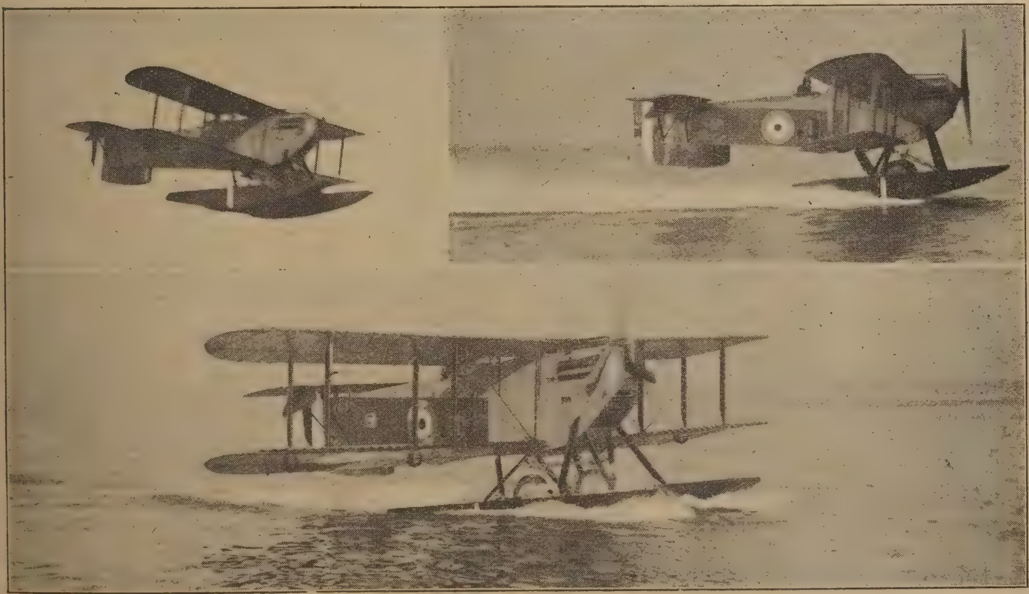
In the issue of this journal for March 16th some consideration was given to the causes underlying the present melancholy state of aerial transport in this realm. It was then suggested that the failure of such air lines as had existed under British management was due largely to faults of policy and of organisation on the part of their promoters, caused by their failure to give heed to the lessons of history.

This is by no means to be regarded as an attempt to impute to those promoters any lack of intelligence. The fact of the matter is that, after the disaster of the Armistice had befallen them, the aircraft manufacturers of this country, seeking a market for their wares and finding none, decided to provde their own market, by themselves using the vehicles which they manufactured upon commercial services. There is no more reason why a competent manufacturer of war aircraft should be, *ipso facto*, an experienced and capable traffic organiser than there is why a distinguished constructor of battleships should be necessarily qualified for the management of a fleet of merchant steamships.

Unlike the ship constructor, however, the aircraft manufacturer was faced by the serious difficulty that very few of those who knew anything about transportation believed in aircraft, and that those who believed in aircraft knew no more about commercial transportation than they did themselves.

### AIR LINES AS BYE-PRODUCTS.

Consequently up to the present all the important attempts at running air lines have been at least initiated as undertakings subsidiary to the promoters' main business of aircraft manufacturing. This being the case it is not surpris-



**THE NAVY'S LATEST.**—The Fairey Type 21 (450-h.p. Napier) under test at Hamble. This machine was exhibited at the Aero Show, Olympia, last year, under a veil of deep secrecy. Though the precise purpose of the machine is not officially announced, it is believed to be a high-speed amphibian fighter for flying off decks of ships or off the sea.

ing that the policy generally adopted has been that of seeking for fields for the useful employment of such aircraft as the manufacturers themselves could produce at the minimum of cost and of disturbance to their established conception of what an efficient aeroplane should be.

As all the manufacturers were naturally largely influenced by the experience of the war, there was a general similarity in the type of aircraft which they conceived to be suitable for immediate commercial use, and only a very limited field for their employment.

### The Need for Constructive Criticism.

The analysis of the causes which have led to the present state of affairs—interesting as it may be—has little value unless it leads to some indications as to the steps necessary to improve the condition of the aircraft industry. But to arrive at any useful deductions of this type it is desirable to consider firstly what condition of affairs it is desired to establish.

And in the beginning it seems to be safe to assume—while international politics continue to wear their present aspect—that considerations of national security are of the first importance.

It has already been pointed out by "Strasbourg" (March 9th) that the idea of a great commercial air fleet available as a reserve force for purposes of offence or of defence is likely to prove but an illusion, and that a soundly organised Air Force backed by a flourishing aircraft manufacturing industry is the only satisfactory solution of the problem of defence in the air. Thus from the purely military point of view the manufacturing industry alone is of serious importance.

### The Commercial Aspect.

Apart entirely from the military aspect of the question there can be little doubt that to the population of Britain a really well organised system of rapid communications, both with business centres in Europe and with our Dominions overseas, such as aircraft could provide, would be an asset far transcending in value the industry which manufactured the aircraft used on that system. That is to say that Britain, from the purely financial point of view, would stand to gain far more from an efficient air transport service, even if equipped entirely with foreign aircraft, than she would be likely to lose by the entire suppression of the manufacturing industry.

But it is obviously impossible to use aircraft if nobody builds them. Despite the British manufacturer's failure as a traffic organiser he is still the most versatile and the most accomplished designer and constructor of aircraft in the world, and, as efficient air services cannot exist without efficient aircraft, the work of British aircraft makers, properly directed, will be an essential part of the work of building up the aforesaid system of air communication.

Thus one is led to the conclusion that the first essential from either the military or the commercial aspect is the placing of the manufacturing industry upon a firm basis.

The direct subsidisation of air services can doubtless be used to promote the existence of air services, and hence to provide a demand for aircraft and so maintain some sort of a manufacturing industry in existence.

### The Evil of Subsidisation.

But subsidies, generally speaking, have extremely evil results. Their effect at the present moment would almost certainly be to encourage the development of air services over routes chosen not in accordance with sound economic principles, but in accordance with the political power or astuteness of the parties interested in the development of particular services.

The indirect effect would be to raise a demand for subsidies which would allow existing machines to operate successfully, rather than to encourage the development of aircraft so economical and efficient that they could operate without subsidies. The only possible method of avoiding this effect would be a Governmental control exercised over the choice of routes and the types of craft endowed with an eye to economy and efficiency which no Government department has yet shown itself to possess.

The direct subsidy therefore fails, in that it will tend to retard advance in aircraft design by reducing the incentive to a full consideration of those economic factors in design which are of the most vital importance. This will in turn retard the general use of aircraft on a scale beyond the national capacity for subsidisation, and so limit the markets open to the manufacturing industry.

### An Alternative.

Under proper conditions direct assistance to air lines could be given by the Government without actual control over their activities, and without any serious ill effects. In order to maintain a proper incentive to progress such assistance must be given in the form of a payment for work done. The business of the Post Office gives to the Government an unrivalled opportunity for giving such assistance in the simplest and most useful way, although it will doubtless be difficult to persuade the Post Office to lend its aid.

Approved air lines should be asked to declare the minimum daily load of mails they estimated as necessary to give them a reasonable paying load for their craft, and their estimate of a fair rate for their conveyance. A certain amount of bargaining on this point would produce reasonable figures.

Figures having been agreed, this volume of mail traffic at the agreed rate of payment should form the basis of a Government grant. This figure would be a minimum, and would only be guaranteed for as long as the company operating the line failed to pay a dividend, or for a defined period, whichever proved the shorter.

The Post Office itself should pay to the Department of Civil Aviation a sum corresponding to the actual mail carried, at the present cost of carriage by rail and/or boat, less 5 per cent. or some such sum, as an incentive to the use of the air line.

The remainder of the grant should be borne on the Air Ministry vote for the assistance of commercial aviation. This additional amount should be fixed upon a sliding scale, decreasing with the amount of the dividend paid by the air line concerned, and ceasing altogether at some agreed rate—say 5 per cent. per annum. If the dividend rose to some higher figure, say 10 per cent., the arrangement should be terminable and the air line should have to tender in public competition with all other forms of transport for any further mail business.

Such a scheme obviously need cost no more than a subsidy, it will take the form of a payment for useful work done, and the sliding scale should provide a very strong incentive to economy and efficiency in the operation of the Air Service.

Doubtless very great care would be required in drafting the regulations for such a scheme, but there should be no insuperable difficulty.

Air lines operating under such a scheme would demand continually improved aircraft, and the effect on the manufacturing industry would be towards continual progress.

### The S.B.A.C. Scheme.

But what is probably the most serious difficulty facing commercial aviation to-day is the difficulty of raising capital. In view of this difficulty Mr. H. Whyte Smith, as chairman of the Society of British Aircraft Constructors, has suggested that the Air Ministry itself should expend a sum—£500,000 was, I believe, the figure suggested—on the purchase of a fleet of commercial aircraft of approved types.

These aircraft were then to be leased to approved air transport companies upon terms which should secure to the Air Ministry interest and sinking fund upon the capital expended. So far as it extends the scheme has considerable merits. It amounts to the advancing by the Government of some part of the capital which it is otherwise impossible to raise, and, as a preliminary it secures the immediated occupation of some number of our aircraft constructors upon remunerative work.

From the manufacturers' point of view there is no fault to be found with such a scheme.

### Some Objections.

But there are objections from other points of view. The actual first cost of the air fleet is but part of the capital needed for the inauguration of an air line. Some of the other parts, it is true, are already borne by the Government, who provide certain aerodromes and other ground organisations practically free of cost.

But to make proper use of £500,000 worth of aircraft a very considerable amount of further capital must be raised, and it is doubtful whether that would at present be possible.

Also the scheme is fairly obviously based upon the assumption that the Air Ministry and the S.B.A.C. between them should determine, in the light of their present prepossessions, what constitutes a suitable type of aircraft for commercial purposes, leaving it to the hoped-for air lines to run their lines as those types would permit. As the failure of all efforts to operate air lines can very largely be traced to the fact that the services have been arranged to suit the available machines, and for success it is essential that services be arranged to suit the needs of traffic, and must be equipped with craft suited to those needs, Mr. Whyte Smith's scheme will be seen to run a risk of continuing the existing evil order of affairs.

### A Sounder Method.

There can be little doubt that if it is necessary for the Government to give to the Aircraft Industry any further assistance than that of promising them a definite volume of mail traffic at remunerative rates of payment, it is preferable from every point of view that that assistance should take the form of an advance of capital, rather than the gift of subsidies.

In order that such advances may be made to produce the best possible results they should be advances towards the capital cost of inaugurating approved schemes of actual

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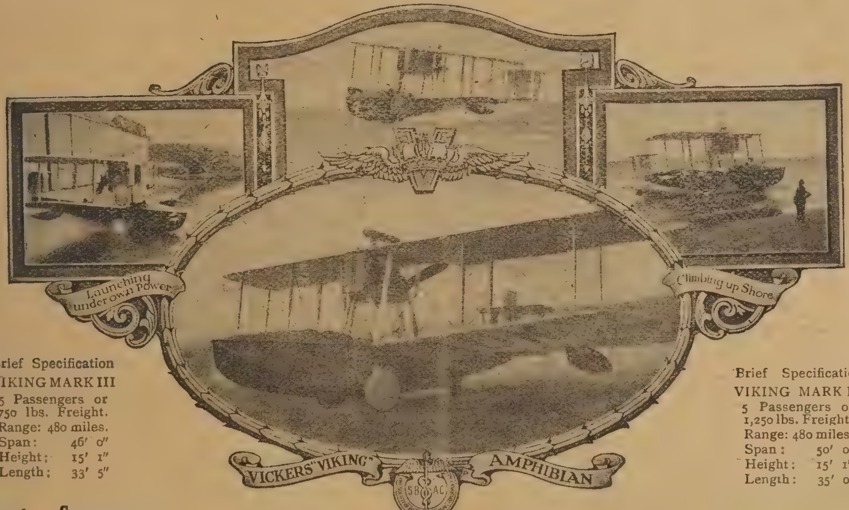

Brief Specification
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Range: 480 miles.
Span: 46′ 0″
Height: 15′ 1″
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**Recent Successes**

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

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Aviation Department,
VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

aerial transportation, and they should be advances made to the concerns which are to operate those schemes. Such concerns must be free to decide upon the type of machines which they require solely upon consideration of the necessities of the traffic which they hope to handle, and therefore it is preferable that these concerns should, as far as possible be separate from all purely manufacturing concerns, who should for their own sakes confine themselves to supplying the demands of operating companies.

### Some Difficulties.

Hard and fast rules as to the conditions upon which such advances of capital should be granted cannot possibly be laid down. A sound development of aerial transportation calls for the exploitation of numerous different types of service, each governed by its own special conditions, and probably calling for special financial treatment.

In no case could a Government grant be expected to cover the whole capital outlay, and it would obviously be wise for the Government to consider each scheme on its merits and vary the proportion of the grant, if any, to the total capital expenditure necessary, in accord with the financial risk involved and the value to the nation of the service proposed.

Such grants would of course carry with them an obligation on the part of the operating company to pay to the Government interest and sinking fund charges on the grant, and would give the Government a first charge upon the whole assets of the concern in the event of a default in the payments

Combined with some such sliding scale system of payment for Post Office traffic carried, a judicious scheme for the advancing of capital to air transport companies would overcome all the more serious difficulties now confronting the Aircraft Industry.

In the long run at least the cost would be very much less than any scheme of subsidisation on the scale which would be necessary to maintain the present type of air services, and the evil effects of subsidies, their tendency to mitigate the effects of inefficient organisation, to cause stagnation in design, and to limit enterprise would be almost entirely avoided.

Given the incentive and the means to develop a sound and enterprising transport industry, the manufacturing industry will need no direct assistance. It possesses sufficient intelligence to make full use of the market which would thus be open to it.

W. H. S.

## TOWARDS THE DEVELOPMENT OF SAFETY AND RELIABILITY.

The official notices of the Royal Aeronautical Society have recently conveyed the information that a Committee has been appointed by that Society to discuss the subject of engines for commercial aviation and certain other cognate subjects.

The precise terms of reference of this committee are as follows:—

To discuss the question of the type of engine and mechanical dispositions required for the safe and economical working of an aeroplane carrying mails (a) between London and Paris, and (b) over a 500-mile route.

The idea underlying the appointment of this committee is to get together both engine and aeroplane designers, together with those who have practical experience of the running of air transport services, and of other methods of transport, in order to thrash out what is necessary to make the aeroplane a thoroughly safe, economical, and reliable vehicle.

The committee appointed for this purpose consists of the following gentlemen:—

Lt.-Col. Mervyn O'Gorman (chairman), Lt.-Col. W. A. Bristow, Lt.-Col. L. F. R. Fell, Capt. G. de Havilland, Capt. G. T. R. Hill, Wing-Commander J. H. A. Landon, Major G. H. Norman, Mr. H. R. Ricardo, Mr. A. J. Rowledge, Col. F. Searle, and Mr. R. McKinnon Wood.

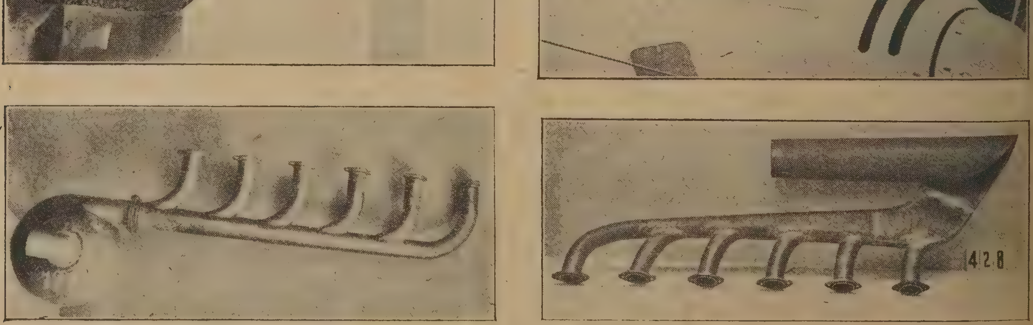
There can be no doubt whatever as to the desirability for a full and thorough exploration of the technical shortcomings of the present-day aeroplane as a commercial vehicle, and of these shortcomings there is little doubt that the engine and the engine installation are responsible for some goodly proportion. The action of the Royal Aeronautical Society in this matter is entirely to be commended. As to the constitution of the actual committee, the only criticism that can be offered is that there appears to be an undue preponderance of engine designers and experts upon the committee.

Major G. H. Norman is, one understands, in charge of engine experiment at the Royal Aircraft Establishment. Mr. H. R. Ricardo is well known for his research work on internal combustion engines, and Mr. A. J. Rowledge is the engine designer of the firm of D. Napier and Son, Ltd.

With these three are associated one aeroplane designer, Capt. G. de Havilland, of the De Havilland Aircraft Company, one magneto and insurance expert, Col. W. A. Bristow, two representatives of the Air Ministry, Wing Commander Landon (Engine Installation Dept.) and Lt.-Col. L. F. R. Fell, both of the Directorate of Research, one traffic expert, Col. F. Searle, late of Air Transport and Travel, Mr. R. McKinnon Wood of the Royal Aircraft Establishment, who is possibly an aircraft designer, and the chairman, Col. O'Gorman, who is of course a host in himself.

A complete attainment of the objects before the committee needs firstly a discussion by the Transport experts of the duties for which they require aircraft, one by the aeroplane designers of what they can do to meet these needs, and what qualities they require in the engines needed for such aircraft, and finally a discussion by the engine experts of how closely they can meet those requirements.

However, the representatives of the traffic and aeroplane design departments, though few in numbers, are of high quality, and one has hopes that really useful results may follow from the setting up of this committee.



SOME GERMAN EXHAUST PIPES.—Top left, an anti-flame arrangement for night flying. Top right, an internally cooled manifold. Bottom left and right, two varieties of silencer.

SUNBEAM-COATALEN
AIRCRAFT ENGINES

The
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Aero Engine.

The high power and efficiency of the "Sikh" engine admirably qualify it for use in the largest aeroplanes.

A six-cylinder vertical form of this engine developing half the power has also undoubtedly a great future as a power unit for the largest airships.

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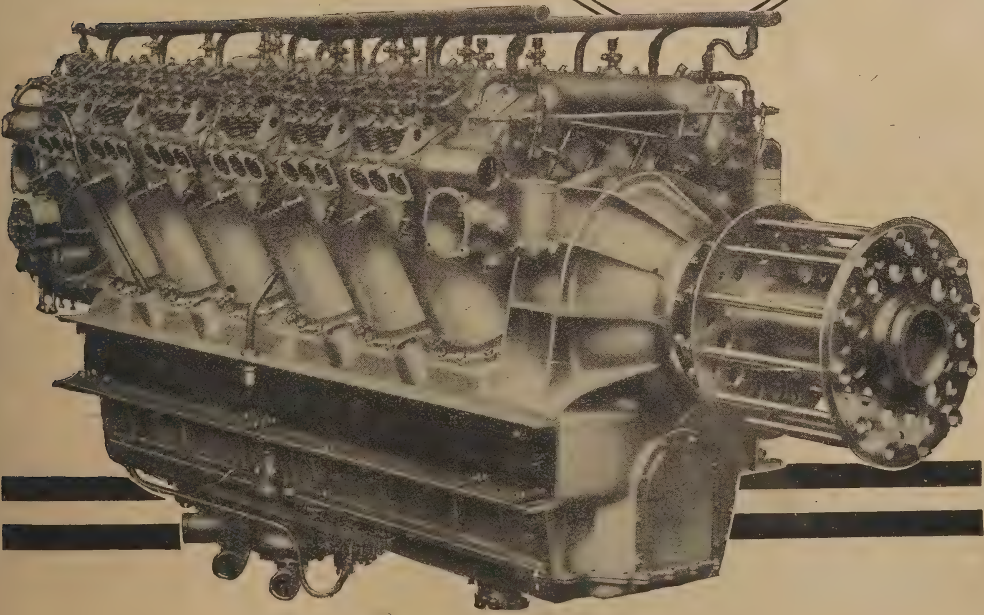


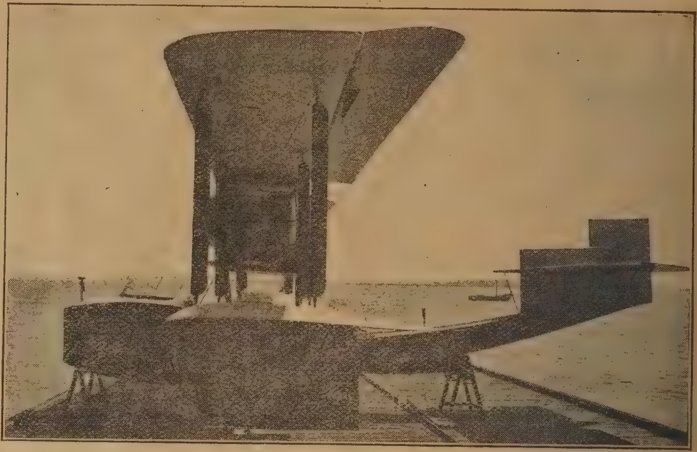
**PASSED BY THE INTER-ALLIED COMMISSION.**—The two photographs and the scale drawing here shown represent the Luft Fahrzeug Gesellschaft's (Roland) V.8 flying-boat, built at the Stralsund works of that company. Fitted only with a Mercédès engine of 120 h.p., it is almost automatically passed as a purely civil craft, and has not been vetoed by the Inter-Allied Commission of Aeronautical Control.

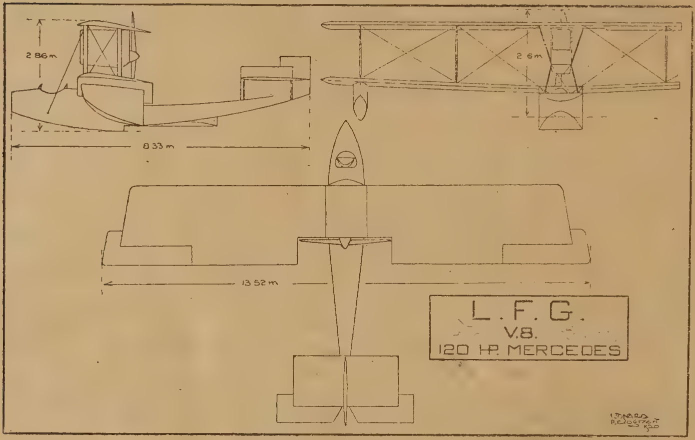
The boat, the wing floats, and the tail unit are largely duralumin built, and bear a great resemblance to those of a Dornier type monoplane built by the same firm.

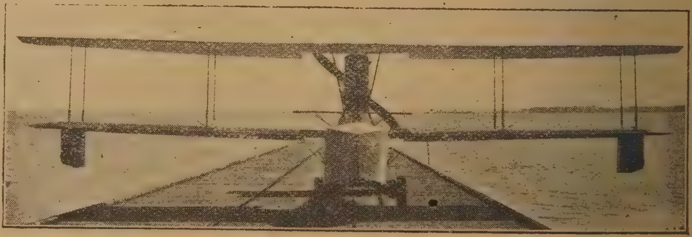
The hull in side elevation shows the existence of two steps, disposed in accord with the results of British experience—a feature hitherto unusual in German flying-boats which seems to indicate that in this matter the German has something to learn from England.

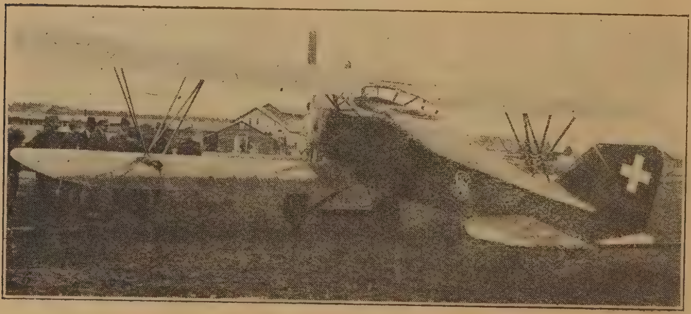
The boat has accommodation for one pilot and two passengers: a third seat may be fitted by reducing the tank capacity.

The boat has a speed of 130 km.p.h. and has five hours' fuel capacity. The span is 13.52 metres, the overall length 8.33 metres, and the loaded weight 1,260 kg.









A SWISS RECONNAISSANCE MACHINE.—The photograph attached shows a military reconnaissance machine built for the Swiss Government by the Swiss Wagon Factory of Schlieren. It shows unmistakable evidence of Teutonic technical influence in the curious bracing arrangements and the sweep back of the upper wing. It is fitted with a B.M.W. engine of 185 h.p.

# AERO ENGINES

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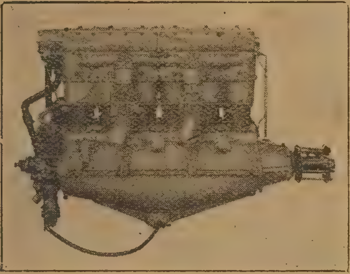

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## THE FIRST BRITISH COMMERCIAL AIRSHIP.

R.36, now disguised under the civil registration marking G-FAAF, is at the moment complete, and, before this note appears in print, may have made her first flight.

R.36 was designed by the Admiralty in 1918, and construction was started by Beardmore, Ltd., at their works at Inchinnan early in 1919. Construction has been delayed owing to the unsettled policy of the Admiralty in regard to airships, and upon their decision not to complete the ship for Service purposes she has now been completed for the Air Ministry as a passenger-carrying ship.

Generally similar in form and construction to the R.34 class, R.36 is of appreciably larger size and of greater power. She is fitted with six cars, five being power eggs, and the sixth a combined passenger and control car.

Of the power eggs, two are forward wing cars, each fitted with a 260-h.p. German Maybach, two are amidships, abreast of the centre of the passenger car, and carry each a Sunbeam "Cossack" of 350-h.p., and the fifth is well aft on the centre line. This last car contains one 350-h.p. Sunbeam "Cossack" engine. Bow mooring attachments are provided to suit the type of mooring mast developed by the British Airship Service.

The most interesting feature of the ship is the accommodation provided for passengers. The passenger car, which is connected to the ship's structure amidships, is a framework built of duralumin girder work of generally similar structure to that used in the framing of the ship proper. It is 131 ft. long and has accommodation for 50 passengers. This car is very considerably wider at the top than at the bottom, and is divided up into cabins by heavy curtains, which can be drawn back during the day time.

At the top of each "cabin" are two folding bunks, and on the ground a table and two comfortable wicker chairs. Windows are fitted to each side giving to each passenger a clear view outwards. A central gangway runs down the car, between the cabins on each side.

At the centre of the car is fitted a cooking galley and pantry, together with lavatory accommodation.

In addition to the passenger accommodation there are the usual quarters for the crew, fitted in the central keel gangway of the main structure, above the passenger cabin. The crew provided for consists of four officers and twenty-four men—captain, first and second officer and engineer officer, two coxswains, seven riggers, thirteen engineer ratings and two wireless operators.

Allowing a margin of fuel for adverse winds, and for the weight of food, water and other necessary stores, R.36 will be capable of carrying 30 passengers, each with 100 lb. of luggage, and one ton of mails, from England to Egypt in about 72 hours For shorter journey the useful load capacity is, of course, greater.

The main particulars of R.36 are given below.

SPECIFICATION OF R.36.

| | | | |
|---|---|---|---|
| Length | 672 ft. 2 in. | Maximum speed | 65 m.p.h. |
| Diameter | 78 ft. 9 in. | Cruising speed | 50 m.p.h. |
| Height overall | 91 ft. 7 in. | Disposable lift (fuel and freight) | 16 tons |
| Volume | 2,101,000 cub. ft. | Weight of fuel consumed | 0.65 tons per 100 miles |
| Gross lift | 63.8 tons | | |
| Total h.p. | 1,570 | | |

## AN AMERICAN ENGINE PROGRAMME.

The Secretary for War and the Secretary for the Navy of the United States have recently approved that work should be carried out on the development of aero engines in accordance with the following programme :—

The engines are divided into three classes :—

(*a*) Engines of interest to both Army and Navy Air Services.
(*b*) Engines primarily of interest to the Army.
(*c*) Engines primarily of interest to the Navy.

The list of engines of the various types are as follows :—

*Type a.*—50/60 h.p., 350 h.p. air-cooled, 550 h.p. water-cooled, 700 h.p. water-cooled, and 1,000 h.p. water-cooled, 160-h.p. six-cylinder water-cooled, 300-h.p. "Cannon" type, 350 to 375 water-cooled "high performance" type, 300-400-h.p. six-cylinder type for airships, and a heavy oil engine, probably of about 500 h.p.

*Type b.*—140/160-h.p. air-cooled for training use.

*Type c.*—200/230-h.p. air-cooled for Naval training and shipboard use, 250/275-h.p. engine for twin-engined torpedoplanes, etc., 650/750-h.p. water-cooled type for large airships.

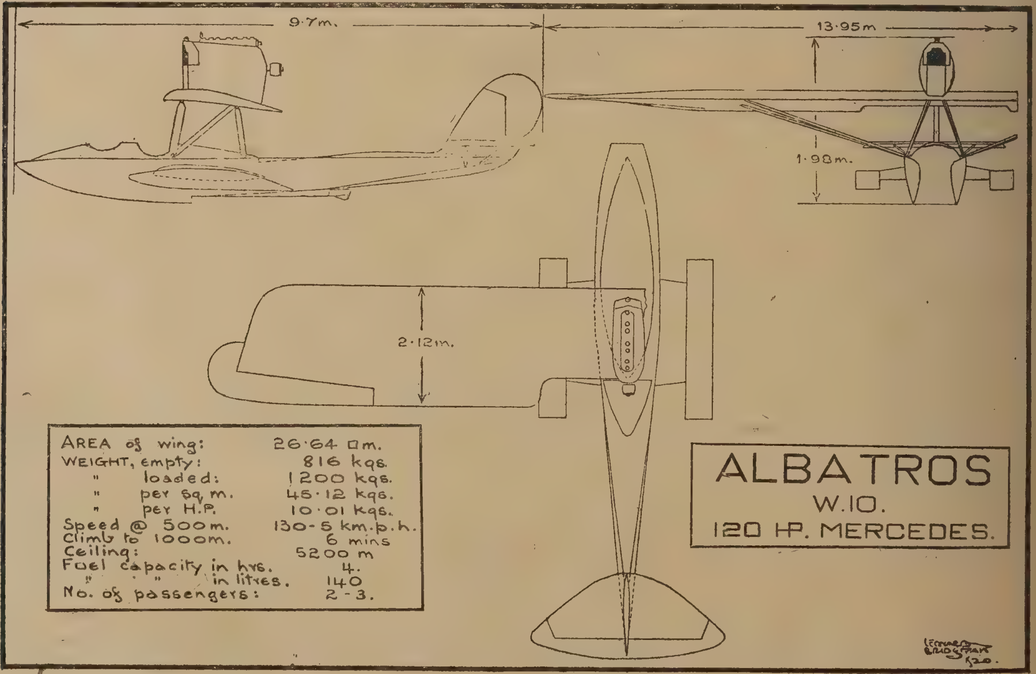
In addition the Navy is to attempt the development of a steam engine, and is making experiments with geared engines.

## THE ALBATROS W.10 FLYING-BOAT.

The flying-boat shown in the accompanying scale drawings is developed from a somewhat similar design prepared before the Armistice and equipped with an engine of smaller power than originally proposed it has apparently passed the censorship of the Inter-Allied Commission of Control as a civil aircraft.

In general outline the machine strongly resembles the Dornier type, but, unlike the Dornier boats, it is not an all-metal affair.

The hull is of three-ply, as are the side balancing extensions thereto. The pilot is accommodated in the nose of the hull; two side-by-side seats for passengers follow, with an emergency seat for a third behind. Ailerons, elevators, and rudder are all balanced, and are built on duralumin skeletons.



"MESMERIC"

FIRTH'S "MESMERIC" CARBON
CASE-HARDENING STEEL.

Equivalent to Air Ministry Specification S 14.

This is a thoroughly reliable case-hardening steel, easy and simple to work, certain and satisfactory in its results. It is celebrated for its tough fibrous core and extremely hard and durable case.

Firth's handbook on Aeroplane steels gives full specifications of this and other standardised qualities, including analyses and mechanical properties.

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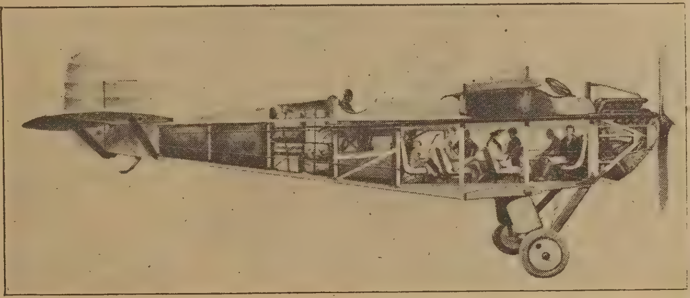
THE
DH18



The machine which can transport 8 passengers at a gross cost of 4D each per mile.

*IMPORTANT:—By GROSS COST is meant fuel, pilot, insurance, maintenance and depreciation of machine and engine, all overhead charges, and every expense involved in running an air line.*

We have one DH 18 machine ready for immediate delivery.

THE DE HAVILLAND AIRCRAFT CO., LTD.,
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# NOTES FROM AMERICA.

## The Engineering Division of the American Air Service.

The Engineering Division of the American Air Service, more generally known as McCook Field, from its situation at the aerodrome of that name at Dayton, Ohio, is an organisation which discharges for the American Air Service the functions discharged in this country by the Royal Aircraft Establishment and the Test Station at Martlesham Heath. In addition it discharges certain of the functions of the Technical Department and of the A.I.D. in Britain, in that it may prepare specifications and supervise the experimental and production manufacture of all aeronautical equipment under construction for the Air Service.

According to reports, since July, 1919, McCook Field has designed and built a single-seater fighter, a two-seater fighter, an armoured three-seater with two Liberty engines, a night-flying two-seater, and a two-seater training machine with a six-cylinder Liberty engine. In addition it has prepared designs of and started the construction of an all-metal single-seater with the 300-h.p. Packard, and of an all-metal monoplane for reconnaissance, and of an all-metal two-seater biplane.

Furthermore it has designed a number of other machines which are being built by external concerns, among them a night bomber designed to carry a load of nearly 9 tons, and equipped with six Liberty engines of 400 h.p. each. Nearly twenty types of outside design have passed through tests and have been modified and developed by the establishment.

A large amount of experimental work on aero-engines has also been carried out. The Liberty engine has been greatly improved, the Wright-built Hispanos have been developed into a highly successful type, and the Engineering Division Model W engine of 700 h.p. has been designed, assembled and tested. Work on air-cooling has been carried on, and contracts for a number of experimental engines varying from the 9-cylinder Lawrance of 100 h.p. which is now being assembled, to certain 9-cylinder engines of 350 h.p. now in the early stages of construction by the Curtiss Co. and by Mr. F. A. Weinberg, have been placed.

Superchargers, leak-proof tanks, instruments, flotation gears, parachutes, wireless equipment and photographic instruments have been tested and improved.

Armament, including synchronising gears, mountings, the development of a "Cannon" engine, and trials of a 2.95 inch mountain gun in a Martin bomber have formed a further portion of the work.

Between January and July, 1921, an experimental order for a three-seater ground fighter fitted with eight or nine machine guns and one 37 mm. cannon, and one for a night bomber with three Liberty engines is to be let. Both are to be of all-metal construction, and the second is to be of the cantilever monoplane type. A new engine of 1,000 h.p. is in process of design, and work is to be continued on this.

## A New Packard Engine.

A new aero-engine, designed and built by the Packard Motor Car Co., of Detroit, has just successfully undergone makers' tests. Like all recent Packard engines, this is generally similar in form and arrangement to the Liberty, in whose design the Packard Co.'s engineers had some considerable share. The new engine is a modification of the Packard 270-h.p. type of 1,116 cub. inches of cylinder capacity fitted with cylinders of increased bore and with a considerably increased compression ratio.

The new Packard 300-h.p. high altitude engine.

That is to say the engine is of the over-dimensioned and over-compressed type designed for high altitude work.

It is a twelve-cylinder Vee type engine, 60 deg. included angle, with separate steel cylinders, 5 in. bore by $5\frac{1}{4}$ in. stroke, with overhead valves and camshafts. The designed output was 300-h.p. normal, the actual maximum power developed on full throttle at sea level being 400 at 2,300 r.p.m. It is stated that, despite the compression ration of 6.5/1, the engine ran under these conditions without detonation or pre-ignition on ordinary undoped petrol—a fact which suggests that the fall in volumetric efficiency at this high speed brought the actual compression down to that corresponding to a considerably reduced compression ratio at more normal speeds. The normal speed for which the engine is designed is probably about 1,600, and the power at that speed is about 320 h.p. Pump lubrication on the dry sump system, dual ignition by Dixie magnetos, and a single Zenith type carburetter, are fitted. The weight dry is 735 lb. Petrol consumption is very closely $\frac{1}{2}$ lb. per h.p. hour at 320 h.p. and 1,620 r.p.m.

# TRADE NOTES.

## Foresight.

Now that the long-expected and equally long-delayed Civil Aviation boom really seems to be in sight, it is as well to consider the question of commercial engines.

During the next year or two, during the vogue of the small machine, engines of about 500 h.p. will be in great demand. Civil Aviation will naturally be somewhat ca'canny, and will be unwilling to experiment with untried engines.

There is only one thoroughly tried engine of that horse-power, and that is the Napier "Lion," which develops 539 h.p.

After the armistice the firm of D. Napier and Son, Ltd., instead of closing down their experimental and productional activities, as did so many aircraft firms, carried on quietly and the consequent success of the "Lion" caused them to get a large order from the Royal Air Force, and also quite a large order from Civil Aviation.

And now as a result they appear to be on the brink of obtaining something like a corner in engines for civil aviation.

That their foresight in carrying on with the "Lion" was not a mere "flash in the pan" is seen from the success of the Napier "Cub." They have foreseen that there must be a demand for an engine of 1,000-1,500 h.p. in about two years' time for Civil Aviation, and by that time there can be little doubt that the "Cub" will be an enormous success.

As a consequence of their foresight the firm of D. Napier and Son, Ltd., are now in a very flourishing condition in spite of their connection with the motor-car industry.—G. D.

## A Good Appointment.

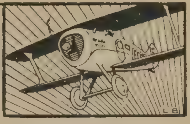
It is of interest to note that Mr. Albert Brown, of the famous firm of Brown Bros., Ltd., of Great Eastern Street, E.C., has been elected as chairman of the new Factors Committee of the Society of Motor Manufacturers and Traders, Ltd. This appointment is of interest in view of the fact that Brown Bros. is one of the very few firms in the motor trade who still believe in the future of the Aircraft Industry. Brown Bros., Ltd., still run an Aircraft Department, which is ready to provide all kinds of accessories, components, and material for aircraft. Most of the firms in the Motor Trade who made vast profits out of the war have deserted the Aircraft Industry, and by a kind of poetic justice have very largely attained to the verge of bankruptcy. It is curious that those who have retained their interest in the Aircraft Industry are incidentally those who are recognised in the Motor Trade itself as being the soundest financially.

## A Fine Performance.

It is of interest to note that in the Mont-Agel hill climb at Monte Carlo the standard six-cylinder Rolls-Royce Car, 1920 model, with full touring equipment, owned and driven by Mr. A. Sanderson, made fastest time and won the first prize. The hill, which rises approximately 3,000 feet. in 6 5/8 miles, was covered in 16 minutes 16 1/5 seconds, which means an average of approximately 25 m.p.h.

This is truly a remarkable performance when one considers that practically the whole course, especially the last part of it, consists of hairpin "lacets" up the mountain side, mostly with unprotected corners or with little futile walls which would do nothing whatever to stop a car of the weight of a Rolls if the driver made a mistake or if anything went wrong with the steering or with a tyre. Not only is the performance remarkable testimony to Mr. Sanderson's driving, but it also indicates the astounding powers of acceleration possessed by the Rolls, as it must have been necessary to slow down to something like 12 or 15 miles per hour at a great many of the corners.

# COMMERCIAL AERONAUTICS
## AND CIVIL AERIAL TRANSPORT.



## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### OFFICIAL NOTICES.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; S.F.S.—Surrey Flying Services; G.E.A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie, M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

#### MARCH 21st:

I.A.L., "Vimy," G-EASI, London-Paris, 12.37-15.10, M., 4, Barnard & 1.
M.A., Breguet, F-CMAI, London-Paris, 12.50-15.00. Nil, 3, Malfanti.
M.A., Spad, F-CMAW, London-Paris, 12.50-14.57, G., Nil, Le Sec.
S.N.E.T.A., DH4, O-BADO, London-Brussels, 12.52-15.02, G.&M., Nil, Van Opstal.
S.N.E.T.A., DH4, O-BATL, London-Brussels, 15.00-17.05, Nil, Nil, Blackburn.
G.E.A., "Goliath," F-FHMU, Paris-London, 11.34-14.35, G.&M., 10, Labouchere & 1.
S.N.E.T.A., DH4, O-BATO, Brussels-London, 11.52-13.50, G.&M., Nil, Wouters.

#### MARCH 22nd:

M.A., Breguet, F-CMAG, London-Paris, 12.44-15.23, G., Nil, Briere.
S.N.E.T.A., DH4, O-BATO, London-Brussels, 12.40-14.45, G.&M., 2, Wouters.
G.E.A., "Goliath," F-FHMU, London-Paris, 12.45-15.15, G., 6, Labouchere & 1
M.A., Spad, F-CMAV, Paris-London, 11.40-14.10, Nil, 2, Le Sec.
M.A., Breguet, F-CMAC, Paris-London, 11.45-14.35, G., 2, Charpentier.
M.A., Breguet, F-CMAH, Paris-London, 11.47-15.02, M., 3, Le Men.
I.A.L., "Vimy," G-EASI, Paris-London, 11.53-14.50, G., 13, Barnard & 1.

#### MARCH 23rd:

M.A., Breguet, F-CMAH, London-Paris, 12.44-15.25, Nil, 2, Le Men.
M.A., Breguet, F-CMAC, London-Paris, 12.45-15.27, G., Nil, Charpentier.
I.A.L., "Vimy," G-EASI, London-Paris, 12.50-15.31, G.&M., 7, Chattaway & 1.
S.N.E.T.A., DH4, O-BATU, London-Brussels, 14.50—, Nil, Nil, Blackburn.
G.E.A., "Goliath," F-GEAD, Paris-London, 11.45-14.40, G.&M., 7, Patin & 1.
S.N.E.T.A., DH4, O-BARI, Brussels-London, 11.56-14.15, G.&M., 1, Van Opstal.

#### MARCH 24th:

G.E.A., "Goliath," F-GEAD, London-Paris, 12.45-15.30, G., 7, Patin & 1.
S.N.E.T.A., DH4, O-BARI, London-Brussels, 12.53-14.50, G.&M., 1, Van Opstal.
M.A., Spad, F-CMAV, London-Paris, 14.05-16.05, Nil, 2, Le Sec.
G.E.A., "Goliath," F-GEAC, London-Paris, 13.10-15.40, G., 8, Favreau & 1
S.N.E.T.A., Avro, O-BADB, London-Brussels, 13.05-17.00, Nil, Nil, Forson.
M.A., Breguet, F-CMAI, Paris-London, 11.36-14.15, M., 3, Challoux.
M.A., Breguet, F-CMAG, Paris-London, 11.37-14.30, Nil, 3, Briere.
M.A., Spad, F-CMAW, Paris-London, 11.52-14.10, G., Nil Malfanti.
I.A.L., "Vimy," G-EASI, Paris-London, 11.42-14.30, G., 5, Chattaway & 1
S.N.E.T.A., DH4, O-BALO, Brussels-London, 11.47-13.50, G.&M., 2, Delzenne.

#### MARCH 25th:

S.N.E.T.A., DH4, O-BALO, London-Brussels, 12.45-15.11, Nil, 2, Delzenne
M.A., Spad, F-CMAW, London-Paris, 13.02-15.17, Nil, 2, Malfanti.
M.A., Breguet, F-CMAI, London-Paris, 12.30-15.00, G., 3, Challoux.
M.A., Breguet, F-CMAG, London-Paris, 12.32-15.15, G., 3, Briere.
I.A.L., "Vimy," G-EASI, London-Paris, 13.00-15.42, Nil, 10, Powell & 1
G.E.A., "Goliath," F-FHMU, Paris-London, 11.43-14.20, G.&M., 9, Favreau & 1.

#### MARCH 26th:

G.E.A., "Goliath," F-FHMU, London-Paris, 12.45-15.30, G., 9, Favreau & 1.
I.A.L., "Vimy," G-EASI, Paris-London, 11.30-14.35, Nil, 5, Powell & 1.
M.A., Breguet, F-CMAH, Paris-London, 12.06-15.00, G.&M., 1, Le Men.

#### MARCH 27th:

NIL.

All Continental times of arrival are 1 hour in advance of G.M.T., but times of departure from Continent are shown as leaving by G.M.T.

### The Air Port of Cricklewood.

#### MARCH 21st:

H.P.T., O/400, G-EATM, Paris-London, 12.00-14.45, G., 7, ——

#### MARCH 22nd:

H.P.T., O/400, G-EATN, London-Paris, 12.15-15.23, G.&M., 7, ——

#### MARCH 23rd:

H.P.T., O/400, G-EATN, Paris-London, 11.38-14.55, G., 8, ——

#### MARCH 24th:

H.P.T., O/400, G-EATK, London-Paris, 12.05-15.15, Nil, 3, ——
H.P.T., O/400, G-EATN, London-Paris, 12.12-15.14, G.&M., 8, ——

#### MARCH 25th-27th:

NIL.

### Air Port Statistics.

#### CONTINENTAL

Machines, 44; Passengers, 168; Crew, 62, Total Personnel, 230.

### Inland Flying at Croydon.

March 21st.—I.A.L., "Vimy," 2 tests (Barnard).

March 22nd.—Nil.

March 23rd.—I.A.L., "Vimy," 3 tests (Barnard 2, Powell 1); G.E.A., "Goliath," 1 test (Favreau).

March 24th.—M.W.T.C., DH6, 1 test (Lovell).

March 25th.—L.A.S., DH6 from Leatherhead and joy-riding (Knowles); Avro from Leatherhead return and joy-riding (Hayns).

March 26th.—L.A.S. DH6 joy-riding (Knowles); Avro from Leatherhead and joy-riding (Hayns); S.F.S., Avro test and joy-riding (Muir).

March 27th.—De Havilland Aircraft Co. DH9 from Stag Lane via Croydon to Eastbourne return (Ortweiler); L.A.S., DH6 joy-riding (Knowles); Avro, joy-riding (Hayns); S.F.S., Avro joy-riding (Muir).

### The London Terminal Aerodrome.

The Instone "Vimy" has been to Paris three times during the week, piloted by Messrs. Barnard, Chattaway, and Powell. On Saturday Mr. Barnard made his début on the D.H.18.

Knowing Mr. Barnard as a pilot and the Napier-De Havilland combination, one felt perfectly justified in going as passenger on the flight. Though Mr. Barnard did not throw it about as he does the "Vimy," his turns were far from flat and his landing was perfect. He told one afterwards that she was very easy to land.

Mr. Powell took the machine (G-EARO, the "City of Cardiff") to Paris on Monday of this week.

On Tuesday of last week M. Favreau went for a long high test flight on a "Goliath." With engines off, he took nearly ten minutes to glide down.

Mr. Chapman has a new pilot, Mr. Hayns, flying his Avro, whose every take-off is well worth watching. Mr. Knowles had a busy day on Friday and Saturday on the D.H.6.

Mr. Muir took Mr. Waring and oneself for the test flight on his new Avro-built Avro. The machine was satisfactory in every way.

Capt. Shaw, late of A. T. & T., has now joined the Aircraft Disposal Company as a test pilot.

Handley Page Transport have not yet arrived, but are still "incessantly expected."

Mr. Game, late of the late A.T. & T., has now joined the I.A.L., as their "Leverton," and so gradually the A.T. & T. personnel are returning to the Air Lines.

There is a rumour of three new machines coming to Croydon—viz., "The City of Laughter," "The City of Tears," and "The City of Beautiful Nonsense."—C. D.

INSTONE AIR LINE
22, BILLITER STREET, LONDON, E.C., and
LONDON TERMINAL AERODROME, CROYDON.
Telephone: AVENUE 3616.

# FOREIGN INTELLIGENCE.

## ARGENTINA.

### The Argentine Aviation Co.

The Argentine Aviation Co. is a small private partnership between M. J. Guichard, late of the French Flying Corps and a son of a well-known family of French planters in the Argentine, and Prince Murat, who will be remembered by some as the original French liaison officer to the first R.F.C., H.Q.

They have five Spad side-by-side two-seater biplanes (80-h.p. Le Rhône) in the country, and in addition have three Spads, four Henry Potez Type VIII side-by-side two-seater biplanes (45-h.p. Potez air-cooled engines) and one Besson dual-control flying-boat on the way out. Furthermore, they have options at very advantageous prices on a large quantity of French Disposal Board material, including 45 80-h.p. Le Rhône engines.

This concern has had no actual business as yet, and works chiefly on credit extended to them in Paris.

### An Opportunity for British Manufacturers.

According to an authority in the Argentine it is probable that the River Plate Aviation Co. who are the most go-ahead concern in the Argentine, and which is run entirely by ex-R.A.F. officers, with British material, will absorb them in order to combine their going concern with the very useful French agencies and French support.

This action is attributed to the high prices charged for second-hand war machines by the Aircraft Disposal Co. and the apparent total lack of elementary business methods of the British manufacturers.

But for the various free advertisements given to British firms by the various technical journals in describing any of their new products, nothing is heard of the British Industry, although American and French firms have all taken the trouble to send catalogues, circulars, etc., in an endeavour to place agencies, etc.

Seeing that the River Plate Aviation Co. of Buenos Aires are shortly proposing to increase their capital, partly for the absorption of the Argentine Aviation Co. and partly for further development, it might be in the interest of all British manufacturers to send all information concerning their post-war productions to this firm, if only to prove that the industry is not quite so dead as might be imagined by those immediately outside Great Britain.

### Banking Enterprise.

A correspondent of The Aeroplane in the Argentine writes :

A week ago, Major Kingsley flew from Buenos Ayres to Montevideo with two passengers, the general manager and local manager of the Anglo-South American Bank. The continuance of the journey by the pilot and passengers into Southern Brazil indicates what is likely to be an every-day affair in a few years. The flight from Buenos Aires to Montevideo took only one hour and twenty-five minutes, and the time taken from the latter capital to Rio Grande do Sul, Brazil, a distance of 520 kilometres, was three hours. On account of the mountainous nature of the country between the two last-mentioned ports, the flight was made at the altitude of 3,000 metres. From Rio Grande another flight of 200 kms. was made to Porto Alegre. The saving of time effected in travelling by this means is at once apparent.

It is not surprising to find British aviators are in the lead in the development of aviation as a business proposition in this country, but it is contrary to all precedent to find bank managers to be among the first to take up something new. It is within the knowledge of the present generation that the banks in London did not show much enthusiasm in the installation of electric light, telephones, typewriters, and other conveniences. It is satisfactory to observe, however, that a British bank is setting the pace in the matter of travelling by air.

Mr. Kiek, one of the passengers in the flight referred to, had already made several flights across the English Channel and on the Continent for business purposes.

### The President of Uruguay Flies.

President Brum, of Uruguay, decided to take a view of his capital from an aeroplane. It is understood that he invited Mr. Wilmot to take his Bristol to Montevideo, which he did, carrying as passengers two Englishmen. Afterwards, His Excellency honoured the pilot by becoming his passenger for a flight lasting over an hour, during which they passed over most of the suburbs and outlying villages near the capital. They were accompanied by General Buguet, Minister of War.

The President expressed himself as greatly pleased with his experience. Mr. Wilmot, who is very popular in Montevideo, has been asked to prolong his visit.—"Dumspiral."

## BRAZIL.

### New Flying School at Sao Paulo.

It is reported that a civilian flying school has been opened at Sao Paulo by three Italian ex-army pilots, Signores J. and H. Robba and D. Bertone.

Three S.A.M.L. biplanes with 110-h.p. Le Rhone engines are in use, and four further Italian machines, together with three "Aviatiks," are expected. It is stated that the school has been besieged by would-be pupils.—

## CHILE.

A company is being formed in the United States of America, with American-Chilian capital, to inaugurate a postal, as well as passenger and goods, service from the U.S.A. to Chile, along the Pacific coast, and calling *en route* at all the large towns along the coast.

A large flying school is shortly to be established at Valparaiso, with funds amounting to over 565,000 pesos, raised by a Committee, aided by a Government grant for the purpose of assisting Civil Aviation.

The flying school aerodrome is to be fitted with permanent hangars and workshops. A suitable landing ground has been secured with an area of about two square miles.—H. G.-C.

## GERMANY.

A correspondent of The Aeroplane in Berlin writes :—

### A New Interconnecting Air Route.

A new air route is contemplated between Lindau and Geneva in connection with the services between Germany and Sweden and Germany and Spain. The machines to be used are the new aeroplanes constructed at the Friedrichshafen Zeppelin Works, able to carry six passengers.

### Baden Airship Shed to be Destroyed.

The Inter-Allied Aeronautical Control Commission has sent a note to the Baden-Baden Town Council demanding that the airship hangar at Baden-Oos be pulled down at once. The town bought the huge hangar some years ago from the original proprietors, the Delag Company, for 80,000 marks, and it was from here that the "Victoria Luise" started on her beautiful circular tours through the Black Forest, Vosges and Odenwald.

The Badenian Air Company, which intends to ply from Frankfort to Lorrach and later on to Munich, is in a state of great anxiety, as this order will annul all its plans, the Baden-Oos station playing a prominent part in the enterprise.

One is informed, by the way, that negotiations are taking place between the Zeppelin Works at Friedrichshafen and the Societé Anonyme Aérienne at Paris. At present no definite details have been published, but this is only a matter of time.

### The Aero Club of Alsace-Lorraine.

The Aero Club of Alsace-Lorraine has been founded at Strassburg under Millerand's patronage, with Marshal Foch and Generals Hirschauer and Castelnau, who are of Alsatian descent, as honorary members.

### Austrian Civil Aviation.

Austrian papers declare that the continuous endeavours of leading circles, as, for instance, the Vienna City Council, the Austrian Air Ministry, and the Austrian Aviation Clubs, to include Austrian aeronautics in international air traffic have been accompanied by a modicum of success that must be described as satisfactory to the appellants.

The Entente has decided to exempt from destruction a certain number of hangars and plants needed for their up-keep, and has notified as such two single and one double hangar on the Vienna-Aspern flying ground, a depot for material, a garage, two workshops, and several offices for management and customs officials; at Graz, two hangars and repair-shops, in Klagenfurt one hangar, etc., and at Innsbruck two hangars for the establishment of an aviation station there.

### The U.S. and the Junkers Monoplane.

News from Dessau, the home of the Junkers machines, says that the American Postmaster-General Burleson has addressed a letter to the U.S. Congressman Mr. Plack, in which he confirms the purchase last year by the U.S. Post Office Department of eight Junkers flying machines from Dessau, which were used for mail transmission between New York, Chicago and Omaha and New York and San Francisco.

The introduction of these aeroplanes (he continues) means a great saving in fuel, as they are able to cover a distance of five and more miles on one gallon of fuel, whilst the average consumption of the other machines plying in aerial postal service runs to a gallon per every two and a half miles or thereabouts. Repairs and up-keep total thirty to forty per cent. less than in the case of the American aeroplanes, whilst the German type possesses a radius of action which is fifty per cent. larger than the American.

[Since then all the Junkers machines have been destroyed, either by fire in the air or by crashes, except one which has been withdrawn by order from service.—Ed.]

### The Bavarian Air Lloyd Reopens.

The Bavarian Air Lloyd, whose complete stock of passenger machines was demolished under the Versailles provisos, recommences regular aerial service from Munich to Lake Constance in the course of March. The Swiss Ad Astra Aero Company connects traffic with Zurich.—S. B.

## ICELAND.

### An Aerial Route.

According to statements made in the Danish Press, it is understood that the Icelandic Company intends to open a foreign aerial route running from Reykjavik to Leeds in England, thence to Copenhagen, and so back to Iceland. Why Leeds?

### A Fish Patrol.

The Avro machines imported last year have done excellent work, particularly in the discovery of shoals of fish. The aerial fleet employed for this purpose is being enlarged by the addition of several new Curtiss biplanes.

## ITALY.

The Italian correspondent of THE AEROPLANE writes :—

### Italian Aviation at the Cross-roads.

Tired of being befooled by Commissions, Committees, Directorates and Ministries, practical men are slowly and surely rising up in their rage against the unnecessary red-tape binding, or, rather, winding-sheets in which civil aviation was wrapped by the politicians at its weak birth.

So Ernest Breda is seen bolding plumping for transport by the only open road, and engaging his big works and means in the building of new or transforming of already well-known weight-carrying aircraft.

Can the Caproni firm be said to have lost faith, who have launched a merchant vessel carrying 100 persons, and destined to take the air lifted by its nine horizontally placed "sails"?

At Turin Lepore is fetching and carrying by the airway, and Rome and Naples are full of activity.

With the hoped-for and almost certain advent of Colonel Moizo to the helm of civil aviation, and the helicopters of the pure-blooded Italian Marchese Pescara and of Ing. Sombarico—a local experimenter whose machine fitted with an I.F. engine has given encouraging results—things look most hopeful in Italy.

As the rules for the Schneider Cup have been made so much easier it is hoped that foreign competitors will turn up on July 31st at Venice.

### Italian Activities.

If one can believe all of which one is officially informed, the coming month will be exceptionally full of notable events. One does not especially allude to flights by comets, shooting stars, etc., but things nearly approaching in speed these latter vehicles are prophesied. Indeed, the organising committees of the numberless races and competitions announced seem rather more pre-occupied in exacting that machines should not attain total invisibility, at any rate when passing the judges' stands, than in organising civilian flight.

One notes a serious current of research and experiment in all branches of aeronautics, for which one may be duly thankful.

Meanwhile, a Savoia, probably a bi-motored affair, is to be seen at Monte Carlo, and the Caproni "Trans-Atlantic" (till the ballast shifted), went strong.

Some disasters are to be chronicled, chiefly among "booty" planes, and at any rate showing that stagnation is not rife.

Military parachute tests are taking place at Rome.—T. S. H.

## MACAO.

Local reports state that aviation in this part of the world can be made quite a profitable occupation. The Chinese Government has absolutely verboten the importation of opium and cocaine, and it is understood that very good prices can be obtained for these commodities when smuggled into the country. Apparently this can be done without much difficulty by aeroplanes from neighbouring countries, so possibly the business is worth serious consideration.

Lest one should be accused of inciting to immoral acts by suggesting that smuggling may be regarded as a paying business, one would merely recall the fact that not so very many years ago England was involved in a considerable war with China because the Chinese Government of the period prohibited the import of opium, and British commercial interests in India desired to export opium to China. The difference between peaceful smuggling and putting a prohibited article across a nation's frontiers by force of arms cannot well be measured in units of morality.

## MEXICO.

### Mexican Air Organisation.

The Secretary of Communications and Public Works of Mexico has created a new department known as the Technical Aviation Department, to study all aspects of official and commercial aviation Senor Juan Guillermo Villasana, who previously held the position of Director of the Bureau of Aeronautical Construction, has been appointed head of this department.

## NORWAY.

### Aircraft Works Closing Down.

A correspondent writes :—

Upon application to Director Hellesen, one is informed that the Norwegian Aircraft Works will probably be forced to adopt the manufacture of wood material. The aeroplane works will thus stop manufacturing flying material. The workmen, foreign instructors and mechanics will be given notice. There is no doubt, according to Director Hellesen, that air traffic in Norway will stop if the Government does not do anything.

### Aeroplanes and Advertisement.

The Freia Chocolate Works, Ltd., of Christiania, the greatest of our firms in this line, has now engaged the Air Company of Mr. Tancred Ibsen to undertake flying trips together with throwing advertisement all over the country. Several flights have already been made.

Further, the Freia Ltd. has engaged Mr. Ibsen to fly through Sweden next spring, as the chocolate works has a sister-manufacture there. The last reports are that another great firm here will try it also.—T. B. S.

### Mileage.

The Danish correspondent of THE AEROPLANE writes :—

The Norwegian Air Ministry publishes the following figures of the activities of the Army and Navy pilots during 1920. A distance of 175,000 km. (or 4 times round the equator) has been covered in 1,460 hours. Fourteen accidents happened, of which four were large ones, ten smaller ones, and none fatal.—E. H.

## PERU.

### Commercial Aviation.

The first private commercial aeronautical enterprise to be established in Peru has just been formed under the name of the Compania Nacional Aeronautica. The whole concern is being run by two Americans, Messrs. M. A. Mott and Lloyd Moore, who will act as sole Curtiss agents in Peru.

The object of this concern is to promote aviation in all its branches throughout Peru. Eight Curtiss aeroplanes, with 90-h.p. Curtiss engines, are now in use; and an aerodrome has been secured on the "Walter Pack Field," Vellaviata, near Lima. Mr. Mott, together with Mr Moore and four other pilots, are in charge of all operations.

Mr. Moore, late of the U.S.A. Naval Aviation Service, with twelve years' experience in that branch of service, was one of the reserve pilots carried by the N.C.3 flying boat during the first trans-Atlantic flight.

A large number of pupils has already been enrolled, and are now under instruction, five of them being ready to take their tickets.

The three-guinea trip over Lima and Callao is one of the great attractions of the day. Cross-country flying is in great demand, and many well-known ranch owners, who live some distance away from the capital, now use the aeroplane as means of quick conveyance, thus saving many hours of unpleasant riding.

It is hoped that shortly eight more hangars will have been erected, making altogether twelve; also another twenty Curtiss machines will be put into use as soon as they arrive, including some of the latest enclosed types. Some machines of this large consignment are to be sent to various parts of the Republic, a few having been purchased by private people for their own use, free tuition being given to the purchaser of a Curtiss machine.—H. G.-C.

## SWITZERLAND.

### Parachutes for Stunting.

The Office Aerien Fédéral, in making special regulations with regard to stunting in Switzerland, specifies that pilots and passengers so indulging must carry parachutes of a type officially recognised by the Office.

As the result of tests, the "Heinecke" parachute, manufactured by Schroeder and Co., of Berlin, has been officially recognised as being suitable for use in Switzerland.

The Office Aerien is ready to examine and test other types, for which their recognition is required.

## UNITED STATES OF AMERICA.

### Avros in the States.

The Lawrence Sperry Aircraft Co., Inc., have recently purchased the entire stock of Avro biplanes and spare parts belonging to the Interallied Aircraft Corporation. These will be marketed at prices ranging from $1,250 to $4,500, according to requirements.

The Sperry Co. are also bringing out a small single-seater sporting biplane similar to a machine, "The Messenger," designed and built by them for the U.S. Army.

### Air Mail Appropriation.

The Senate Committee has restored the original sum of 1,250,000 dollars asked for the Post Office Air Mail, and has increased it to 1,500,000 dollars. The U.S. Navy, it is believed, will get 60,000,000 dollars.

# R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

Air Ministry, Dec. 10th.

Royal Air Force.—Flying Branch.—The following are transferred to unempld. list, and are restored to the Active List (Nov. 23rd):—Lt. J. Valentine (June 29th). (Substituted for notification in the *Gazette* of July 6th) Sec. Lt. B. Dixon (March 25th), (substituted for notification in the *Gazette* of April 6th).

Memoranda.—Flight Lt. (Hon. Sqdn. Leader) T. Armstrong (Qrmr. and Hon. Maj., R. Welsh Fus.) relinquishes his temp. R.A.F. commn. on return to Army duty (Nov. 16th).

Air Ministry, Dec. 14th.

Royal Air Force.—Technical Branch.—Pilot Officer J. S. Ferguson to be Flying Officer (Grade B), without pay and allowances of that rank, Nov. 22nd, 1919.

Air Ministry, Dec. 17th.

Royal Air Force.—Permanent Commissions.—The following are granted permanent commns. in the ranks stated, with effect from the dates indicated, retaining their seniority in the substantive rank last held prior to the grant of this commn:—

Sqdn. Ldrs.—J. S. T. Bradley, O.B.E., Sept. 16th, 1919; J. W. Cordingley, O.B.E., Nov. 28th, 1919; W. S. Douglas, M.C., D.F.C., March 30th; R. P. Willock, Sept. 12th, 1919.

Flight Lts.—F. H. Coleman, Oct. 24th, 1919; G. H. Hooper, M.C., D.F.C., Dec. 12th, 1919; J. C. Slessor, M.C., March 9th; T. Q. Studd, D.F.C., Oct. 24th, 1919.

Flying Officers.—J. F. T. Barrett, Sept. 16th, 1919; A. C. Bayley, Oct. 24th, 1919; A. J. E. Broomfield, D.F.C., Sept. 12th, 1919; W. R. Cox, M.C., A.F.C., G. S. Hodson, A.F.C., H. T. Lydford, A.F.C., S. L. Quine, M.C., A. R. M. Rickards, Oct. 24th, 1919; R. C. Savery, D.F.C., Sept. 12th, 1919; E. E. Turner, D.F.C., W. M. Yool, Oct. 24th, 1919.

The notifications in the "Gazettes" of the dates indicated above, appointing these officers to short service commns., are cancelled.

Flying Officer C. R. Fenton, M.C., resigns his permanent commn., and is permitted to retain the rank of Lt., Dec. 8th.

The notification in the "Gazette" of Aug. 1st, 1919, appointing Flight Lt. D. H. M. Carbery, M.C., D.F.C., to a permanent commn., is cancelled.

Stores Branch.—The following are granted permanent commns. in ranks stated, with effect from the dates indicated, retaining their seny. in the substantive rank last held prior to the grant of this commn.:—

Flight Lts.—W. Burkinshaw, Dec. 1st; V. J. B. Jacobs, June 17th; C. A. Shaw, D.S.O., June 17th; T. A. G. Hawley (previously known as A. Hawley), July 20th.

The following are granted permanent commns. in the ranks stated, with effect from the dates indicated, retaining their seny. in the substantive rank last held prior to the grant of this commn., and are transferred to the Stores Branch, with effect from June 17th:—

Flying Officers.—A. S. Berry, Sept. 12th, 1919; C. J. Elliott, Sept. 12th, 1919; W. C. Green, M.C., Sept. 16th, 1919; V. S. Holbrook, Nov. 11th, 1919; R. H. Latham, Oct. 24th, 1919; S. G. Linssen, Sept. 12th, 1919; W. G. MacD. Nicholl, Nov. 11th, 1919; E. A. Tottle, Nov. 11th, 1919; A. P. Woollett, Sept. 12th, 1919.

The notifications in the "Gazettes" of the dates indicated above, appointing these officers to short service commns., are cancelled.

Short Service Commissions.—The following are granted short service commns in the ranks stated, with effect from the dates indicated, retaining their seny. in the substantive rank last held prior to the grant of this commn., except where otherwise stated:—

Flight Lts. (for four years on the active list).—F. Fernihough, M.C., Dec. 3rd; T. Henderson, M.C., A.F.C., Nov. 30th.

Flying Officers.—S. A. H. Bowyer, Dec. 10th; C. C. Clark, Oct. 24th, 1919 (substituted for notification in the "Gazette" of that date); P. Chauncy, Nov. 24th; J. Durward, Dec. 7th; C. W. Hill, Dec. 6th (for four years on the active list); K. Loughlin, Nov. 29th; E. H. Oxley-Boyle, Nov. 26th (for four years on the active list); J. F. Stallard, Nov. 17th; R. S. Walter, Nov. 24th.

Pilot Officer on Probation.—R. E. Baugh, Oct. 30th (and with seny. of that date).

Sqdn. Ldr. E. M. Bettington resigns his short service commn., and is permitted to retain the rank of Maj., Oct. 10th (substituted for the notification in the "Gazette" of Nov. 9th).

Air Ministry, Dec. 21st.

Royal Air Force.—Permanent Commissions.—Flying Offr. T. A. G. Hawley (previously known as A. Hawley) is granted a permanent commn. in the Stores branch, retaining his present substantive rank and sen. (July 20th) (substituted for notification in *Gazette* Dec. 17th).

Flt. Lt. F. W. Hudson, D.F.C., is placed on retd. list (Dec. 22nd).

Short Service Commissions.—Flying Offr. A. J. Dawes resigns his short service commn., and is granted rank of Maj. (Dec. 22nd).

Flying Offr. W. G. Murray resigns his short service commn., and is granted rank of Capt. (Dec. 22nd).

Flying Branch.—Flying Offr. S. M. Kinkead, D.S.O., D.S.C., D.F.C., is placed on half-pay list (Scale B) (Dec. 23rd).

Air Ministry, Dec. 24th.

Royal Air Force.—Permanent Commissions.—Sqdn. Leader D. R. MacLaren, D.S.O., M.C., D.F.C., resigns his permanent commission, and is permitted to retain the rank of Major, Nov. 1st.

Short Service Commissions.—Flt. Lt. L. A. McDougald relinquishes his commission on account of ill-health contracted on active service, and is permitted to retain the rank of Capt., Dec. 25th.

Flying Officer F. H. Rowan relinquishes his commission on account of ill-health contracted on active service, and is granted the rank of Capt., Dec. 25th.

Flying Branch.—Sqdn. Leader R. B. Ward, A.F.C., is placed on the half-pay list (Scale B), Dec. 21st.

Air Ministry, Jan. 11th.

Royal Air Force.—Flying Branch.—Pilot Officer E. Fulford to be Flying Officer, Sept. 23rd, 1919.

Flying Officer J. H. Jephson is placed on half-pay list (Scale B), Dec. 31st, 1920.

Administrative Branch.—Sec. Lt. Lou Htin Wah relinquishes his temp. R.A.F. commn. on ceasing to be employed, Dec. 16th, 1920.

Technical Branch.—Pilot Officer L. D. Stewart to be Flying Officer (Grade A.), Oct. 1st, 1919.

Memorandum.—Group Capt. R. Gordon, C.B., C.M.G., D.S.O., is placed on half-pay list (Scale B), Nov. 26th, 1920.

Air Ministry, Jan. 7th.

Royal Air Force.—Permanent Commissions.—Flying Officer G. Bowen is granted a permanent commn., retaining his present substantive rank and seniority, Aug. 1st, 1919.

The following are granted permanent commns. in the ranks stated with effect from the dates indicated, retaining their present seniorities in those ranks:—

Flight Lts.—W. H. E. Kemp, A.F.C., Sept. 12th, 1919; A. H. Peck, D.S.O., M.C., Oct. 24th, 1919.

Flying Officers.—H. O. Brown, M.M., Sept. 12th, 1919; G. D. Daly, Oct. 24th, 1919; T. A. Langford-Sainsbury, A.F.C., Sept. 12th, 1919; H. N. Young, D.F.C., Oct. 24th, 1919.

The notification in the *Gazettes* of the above dates, appointing these officers to short service commns., are cancelled.

Flight Lt. W. W. Wakefield is granted a permanent commn. as Flying Officer, with seniority of April 1st, 1918, and a precedence next below Flying Officer B. E. Harrison, A.F.C., Oct. 24th, 1919.

Flying Officer G. E. Creighton resigns his permanent commn., and is permitted to retain the rank of Lt., Jan. 6th.

Stores Branch.—Squadron Leader G. Laing, O.B.E., and Flight Lt. C. F. Rasmusen, O.B.E., are transferred to the Stores Branch with effect from Dec. 31st, 1920, and promoted to Wing Comdr. and Squadron Leader respectively, Jan. 1st.

The following are granted permanent commns. in the ranks stated, with effect from the dates indicated, retaining their seniority in the substantive rank last held prior to the grant of this commn., except where otherwise stated:—

Flying Officers.—F. A. Osborn, M.M., June 17th, 1920; J. K. McDonald (previously known as J. McDonald), E. Meynell, D.C.M., H. J. Payne, F. Whilton, D.C.M., July 20th, 1920.

Flying Officer (from Pilot Officer).—F. C. Griffin, July 20th, 1920, and with seniority of that date.

The following are granted permanent commns. in the rank stated, with effect from the dates indicated, retaining their present seniorities in those ranks (except where otherwise stated), and are transferred to the Stores Branch with effect from June 17th, 1920:—

Flying Officers.—T. H. Evans (since promoted), C. H. Masters, Sept. 16th, 1919.

Flying Officers (from Pilot Officers), with seniority of the dates indicated:—W. B. Frederick, Oct. 24th, 1919; R. W. Stevenson, A. T. Wells, Sept. 12th, 1919.

The notifications in *Gazettes* of above dates, appointing these officers to short service commns., are cancelled.

Flying Officer G. E. Pyne is granted a permanent commn. with effect from Jan. 1st, 1920, retaining his present substantive rank and seniority, and is transferred to Stores Branch with effect from June 17th, 1920.

Royal Air Force Medical Service.—The following Sgt.-Majors, Class I, are granted permanent commns. as Qrmrs (Medical) and Flying Officers, with effect from dates indicated:—187485 C. B. Willsher, Aug. 1st, 1919; 302630 W. Gamblen, July 1st, 1920; 301542 F. W. Goodread, Sept. 1st, 1920; 302629 P. H. Musgrave, Nov. 3rd, 1920 (substituted for notifications in *Gazettes* Oct. 12th, 1920, and Nov. 16th, 1920).

Short Service Commissions.—The following are granted short service commns. in ranks stated, with effect from dates indicated, retaining their seniority in substantvie rank last held prior to grant of their commns., except where otherwise stated:—

Flying Officers.—P. A. de Fontenay, Dec. 18th, 1920 (for four years on active list); H. B. D. Harrington, Dec. 6th, 1920; E. N. Hewitt, Dec. 12th, 1919 (substituted for notification in *Gazette* of that date); N. C. Saward, Dec. 29th, 1920 (for four years on active list); R. Stephenson, D.F.C., Jan. 4th (for four years on active list); F. F. Tattam, June 26th, 1920 (substituted for notification in *Gazette* July 2nd, 1920).

Pilot Officer on Probation.—E. R. Lush, Nov. 9th, 1920 (and with seniority of that date).

The following Flying Officers resign their short service commns., and are permitted to retain rank of Lt.:—C. G. Gilbert, Jan. 8th; R. W. Godfrey, Oct. 30th, 1920 (substituted for notification in *Gazette* Oct. 29th, 1920).

Stores Branch.—The following are granted short service commns. in the ranks stated, retaining their seniority in the substantive rank last held prior to the grant of this commn.:—

Flight Lt.—G. E. Stagg, M.B.E. (since promoted). Flying Officer.—R. Adams, June 17th, 1920.

## PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of The Aeroplane. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]

### Engagement.

THOMAS—HAWORTH-BOOTH.—The engagement is announced between Flight Lieut. Godfrey M. Thomas, D.F.C., R.A.F., youngest son of Mr. Herbert T. Thomas and the late Mrs. Thomas, of Savanna-la-Mar, Jamaica, and Kew, and Constance Cordelia, only daughter of Rear Admiral Sir Francis and Lady Haworth-Booth, of Haworth Hall, Hullbank, Hull.

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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... ... ... *Back Cover*
Arrol-Johnston, Ltd. ... ... ... *Front Cover*
Auster, Ltd. ... ... ... ... ... *Front Cover*
Beardmore Aero Engines, Ltd., The *Front Cover*
Bristol Aeroplane Co., Ltd. ... ... ... 300
Burlington Publishing Co., Ltd., The... ... 314
Cunard Line ... ... ... ... ... ... 316
Davis Furnace Co., The ... ... ... ... 315
De Havilland Aircraft Co., Ltd., The... ... 309
Fairey Aviation Co., Ltd., The ... ... ... 295
Firth, Thos., & Sons, Ltd. ... ... ... 309
Handley Page, Ltd. ... ... ... ... 307
Imray, Laurie, Norie & Wilson, Ltd. ... ... 316
Instone Air Line ... ... ... ... ... 312
Metal Airscrew Co., Ltd.... ... ... *Front Cover*
Naylor Brothers (London), Ltd. ... ... 315
New Pegamoid, Ltd. ... ... ... ... 316
Nieuport and General Aircraft Co., Ltd. ... 307
Roe, A. V, & Co., Ltd. ... ...*Inside Front Cover*
Rolls-Royce, Ltd. ... ... ... ... ... 297
Rubery, Owen & Co. ... ... ... *Back Cover*
Sankey, J. H., & Son, Ltd. ... ... ... 315
Sunbeam Motor Car Co., Ltd. ... ... ... 305
Supermarine Aviation Works, Ltd., The *Back Cover*
Titanine, Ltd. *Front Cover & Inside Back Cover*
Vickers, Ltd.... ... ... ... ... ... 303

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APRIL 6, 1921.

# THE AEROPLANE

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## ON A £1,000,000 NATIONAL AIR TRANSPORT COMPANY.

How little the British business man and his worthy representative the editor of the average daily paper realise the importance of air transport may be gathered from the complete indifference shown in the Press concerning the fate of the £1,000,000 National Air Transport Company for which a scheme was submitted to the Air Ministry some few weeks ago. Here was a scheme, adequately financed by some of the greatest business firms in the British Empire. It was organised on such a scale as to be capable of putting British Civil Aviation on a sound footing once and for all. And it had every prospect of setting up that strong and sound Aircraft Manufacturing Industry which, according to politicians of all creeds, is to be the future safeguard of Great Britain against aerial invasion.

Instead of accepting the £1,000,000 scheme, or even investigating it as it deserved, officials of the Air Ministry turned it down under circumstances which certainly decrease one's respect for some of the officials of that Department. Hitherto, though one may have differed from the opinions of certain officials, one has at any rate regarded all of them as honourable men in the strictest sense of the word. Now one begins to fear that somewhere or other in the Department the word honour is not understood as it is by officers and gentlemen, but only as it is commonly accepted by business men and politicians of the modern type who are not even clever enough to realise that honesty is the best policy merely as policy.

It will be remembered that when the £1,000,000 scheme was mentioned in the Press the Air Ministry denied officially that any such *guaranteed* scheme was before the Ministry. One happens to know, on evidence as trustworthy as if one had seen the documents in the case, that such a scheme was submitted and that it was as fully guaranteed as if it had the Government's own guarantee—perhaps even more so, if one considers the value of the word of the present Government.

The quibble—a particularly feeble quibble—in the Air Ministry's statement was that at the moment when the statement was issued the scheme was not *before* the Ministry as it had already been turned down, owing to the starting of the present hotch-potch air line arrangements.

There was also the further quibble that any scheme which might have been submitted was not guaranteed, in that the names of the financial backers of the guarantee were not given to the Air Ministry. The point here is that the names of the guarantors were to be given to the Air Ministry when the Air Ministry, after due consideration, had approved the scheme, the final acceptance of the scheme itself being dependent on the guarantors being satisfactory to the Air Ministry.

No sane man with a high personal reputation would be likely to put up a £1,000,000 scheme to a Government department without first being sure of his guarantees, so it may be taken that the guarantees were good enough. *But*, as the Air Ministry turned down the scheme, apparently without giving it consideration, it was literally true that the officials of the Air Ministry did not know the names of the guarantors, and so, according to the ordinary commercial standard of honour, it was true to announce that the Air Ministry had not (at the moment of the announcement) a guaranteed scheme before it. Which does not alter the truth of the statement which one now makes that the Air Ministry had had (a few hours earlier) a fully guaranteed scheme before it for a million pound National Air Transport Company.

### The Backers of the Scheme.

It was stated in the Press at the time that the guarantors of the scheme were the British and Foreign Investment Corporation. One has good reason for saying that the statement, despite its appearing in the non-technical Press, was accurate.

It is truly extraordinary that this firm should have guaranteed the scheme, for it will be remembered that the same firm floated the great but ill-fated Aircraft Mfg. Co., Ltd. That flotation as such was a success, and the firm has nothing with which to reproach itself on that score. But the fate of the "Airco" after falling into the hands of the motor trade might have deterred a great financial house from touching again anything concerned with aircraft.

The fact that the British and Foreign Corporation, together with certain other very important banking and transport firms, should be not only willing but anxious to support a truly national air transport scheme proves conclusively that among the higher grades of our business men there is a proper understanding of the importance of air transport to our commercial future and of the vital necessity of a strong Aircraft Industry to our national existence. It is therefore the more lamentable that a great national scheme should have been turned down in favour of a small and admittedly temporary scheme which may be a commercial proposition for the time being for the firms which are engaged in it, but is very far from being such a national affair as is needed for the good of British Aviation to-day, and is equally far from being such an Air Transport concern as we might have had if the Air Ministry had taken a bigger view of the situation and had acted in a less disingenuous manner.

### The National Impulse.

The absolute cessation of British air transport between England and the Continent, and the fact that we were paying at the rate of £1,000,000 per annum to the Department of Civil Aviation merely to administrate foreign aircraft across the Channel, was enough to bring the best of our big financiers and business men forward to save our national reputation. Their pride in things British was touched and perhaps they were even a trifle scared at our downfall from the leading place in the World's Aviation which was once held by British commercial aircraft.

Moreover, it is possible that the successful formation and operation of the Koninklijke Luchtvaart Maatschapij (or Royal Air Transport Company) in Holland by the big petroleum, shipping, and banking interests in that country may have suggested that purely as a matter of international commercial prestige it would be well if big firms of similar species in this country would display similar business acumen.

But it seems natural that if one goes now to these same financiers for support they should point out that British aeroplanes are again crossing the Channel, that the Government is saving them the trouble and risk of doing what they were prepared to do, and that therefore their money is not available for the desirable National Company.

### A Lunch Story.

The situation rather reminds one of the story of the Jew man who asked a friend to lunch. They chose to start on soles, and the waiter brought a big sole and a little sole. The host gave his guest the little sole and kept the big one himself. Whereupon the guest said: "You're a nice kind o' pal to ask a feller to lunch, keepin' the biggest fish for yourself!" The host asked: "Vot vould *you* 'a' done?" The guest said: "Vy! I'd 'a' given you the big fish and kept the little vun meself!" To which the host replied: "Vell! Yer got the little vun. Vot yer grumblin' about?"

We *have* got the little one. It is true that little fish are sweet, but they are not satisfactory to a hungry man. And at the moment British Civil Aviation is very hungry indeed.

The joke in this case seems to be that our host, the Air Ministry, having handed out the little fish, seems to have an idea that it is going to have the big £1,000,000 National Company itself. In other words, one gathers that the Air Ministry has a notion that it is going to form a £1,000,000 scheme apart from the scheme which has already been submitted to it (despite its disingenuous denials). Personally, if one happened to be a big financier—which unfortunately one is not—one would hate to commit one's wealth to the care of a Department which has acted as unwisely (to put it as kindly as possible) as has the Department of Civil Aviation in the matter which has been discussed.

## Poor Prospects.

Even if the Department does succeed in securing the £1,000,000 or thereabouts it must be a matter of months before anything like a going concern is produced. And when it is produced it will be coddled and cockered-up by Government officials and must therefore be a weakly ricketty growth instead of being as it should be a strong sound commercial concern strengthened by being left out in the cold so far as officialdom is concerned.

As one said in this paper months ago, if Commercial Aviation cannot succeed on its merits, without subsidies and artificial feeding, then the best thing it can do is to die. Either Air Transport is a commercial proposition or it is not. If it is, then it will succeed in spite of Government interference. If it is not, then no amount of official coddling will make it a success.

As a matter of fact Air Transport is a commercial proposition and so it will succeed. But this latest specimen of Government interference will certainly hinder its success. As the affair stands at present we shall be lucky if we get a big National Air Transport Company going with Air Ministry help by 1923, or even in time for the Americo-Japanese War. If the Air Ministry had let well alone we might have had Commercial Aviation in full blast by the end of this year.

## What Might Have Been.

Big financiers, men of vast experience in the science of transport, real business men, engineers of high standing and other useful people were prepared to give their services as directors free of charge to the proposed company. And the banks were ready to put their money down. The whole thing could have become a going concern in a few weeks, and it would have been absolutely free from the taint of being connected with or allied to any manufacturing concern, a taint which is bound to hamper the development of any transport concern.

Such machines as were fit for temporary use in air transport would have been put into operation. Others would have been ordered at once, for immediate delivery. Experimental machines of new types would have been put in hand. Every manufacturer who could submit an improved design for a commercial aeroplane would have had his chance of orders. New lines, such as direct sea-lines between the North of Britain and Scandinavia, would have been started. Extensions of Continental routes would have been organised. And aviation generally would have renewed its activities.

## The Very Temporary Show.

As it is we are still playing about experimentally with the old old London-Paris route, using obsolescent or obsolete machines. Everything is temporary. All the employees are uncertain of their jobs and are looking round for better opportunities abroad—as for example some of our best air-line people who have gone to Japan—when their whole outlook ought to be towards the magnificent future of our National Air Transport Company. There are petty jealousies and jeers between the people of one firm and another when all ought to be working together for one end.

The only consolation is that the present arrangement is temporary. If it were supposed to be permanent one would despair of British Civil Aviation.

One can only hope that when Mr. Churchill returns from his trip to the Middle East he may be able to spare time to clear up some of the mess that has been made in his absence. The "Messpot" mess which provides friend "Poy" with so much easy humour is of less fundamental importance than is the present state of Commercial Aviation. As George Robey used to say, the "mess-up at 'ome'ere" is worse than Messopotamia.

One hopes also that when Sir Frederick Sykes returns from his trip to the Riviera with the hind legs of the Coalition elephant (*vide* "Poy's" greatest cartoon) he will be able to devote his undoubtedly great mental ability to putting things straight after the tangle in which he left the air line proposition.

## New Machines Wanted.

A most peculiar fact arises out of the existing muddle, namely, that the present "mock-up" air service absorbs all the aeroplanes in England which have any pretension to being commercial aircraft which are capable of paying their way with passengers and goods. There are a few other machines left which were designed for civil and not for war flying, and might conceivably pay their expenses if always run with full load and aided by a subsidy. But so far as one can recall there are none capable of earning their own livings other than the "Vimy," the D.H.18, and the Westland which won the Martlesham Competition.

This means that if anybody comes along and wants to start a new air line, or if the people running the existing temporary arrangement want to extend their services and become real permanent air lines, they cannot do so without buying new machines. Which may be very good for the few aircraf firms which have any idea of how to build a commercia aeroplane, but discloses a very grave outlook for the immediate future of Civil Aviation.

None of the manufacturers are going to build commercia aeroplanes on speculation. Few have the pluck or enterprise even if they had the money. The air line people, being only temporary, are not going to order any more, although they know there is going to be a rush of passengers this summer Consequently we shall find ourselves at the end of this year just as badly off as ever, thanks to disappointed passengers who have either been crowded out of British machines or have been conveyed in obsolescent machines of 1915-17 type when they expected the flying saloons of which the "experts" of the daily Press have been blathering.

And even if somebody comes along during the next few weeks and orders commercial aeroplanes of new and improved types they cannot have them before August or September at earliest, when it will be too late to do any good, and when the French will have acquired practically all the traffic. So now one can see how much better it would have been if the Government had from the outset refused all subsidies and had left Civil Aviation to sink or swim on its merits.

## The Proof of the Pudding.

Just by way of clearing the air it may be well to add a few notes on the Air Transport question generally.

Let it be clearly understood that so far all air transport has been purely experimental. It has never been tackled as a commercial proposition. Before that could be done it was first necessary to prove that aeroplanes could operate with enough regularity to make them worthy of consideration by business men. That has been proved with war machines and war engines which were entirely unsuited to commercial work.

The first demonstration was given by the R.A.F. immediately after the Armistice. Between November 11th, 1918, and March 1st, 1919, an irregular mail service was run from Calais to various points where our Armies were situated; 1,023 journeys were started; 45 failed. Thus the service in December, 1918, and January and February, 1919, showed 96 per cent. efficiency.

From March 18th, 1919, the service ran from Folkestone to Cologne. In six months 1,842 trips were made; 3,000 hours were flown on 139 days. The pilots were not specially chosen. They were good, bad and indifferent as might occur. Of the 1,842 journeys, 1,775 were done the same day; 2 per cent. were stopped by mechanical failure, 2 per cent. were stopped by weather And the over-all efficiency was again 96 per cent.

Of these, 270 were intended to be direct non-stop flights from Folkestone to Cologne, and of them 267 were completed, showing 99 per cent. efficiency.

## An Empty if Priceless Flagon.

Thereafter followed what Captain Sayers correctly, though apparently rudely, called recently "the Holt Thomas *fiasco*." Air Transport and Travel, Ltd., set out to prove that a commercial aeroplane service could run regularly between London and Paris. From the autumn of 1919 till nearly the end of 1920 the A.T. & T. service ran with a regularity only exceeded by the best British railway lines. Certainly it succeeded in crossing the Channel on many occasions when the boats failed, and certainly it was more regular than the French railways or the railways of any other nation.

Despite its regularity and the immense saving of time effected the obtuse British business man refused to supply it with passengers and freight. The still more obtuse Postmaster-General—that Illingworth who will go down to history as the imposer of impossible telephone charges and the neglecter of air mail possibilities—refused to speed-up our commercial mail work by using A.T. & T. Ltd. Thus, as loads for the machines did not come in, A.T. & T. Ltd. remained an empty flask—which is what a *fiasco* means. And a flask is none the less empty if it be made of the best Venetian glass instead of merely common beer-bottle material.

The last person to blame for the fiasco is Mr. Holt Thomas, who lost heavily over the whole affair. The people to blame are primarily the Post Office people and the business community who neglected their opportunities, and secondarily the motor trade people into whose hands A.T. & T. Ltd. fell and who could not see that it would pay them to keep the service going, although so advised by Mr. Frank Searle one of their own most experienced transport experts.

## Something Done.

But, A.T. & T. Ltd. did prove conclusively that a well-managed air line can run to schedule practically regardless of weather. And this was proved with what has been described graphically as "ex-war junk." And the service was stopped, by men who are supposed to be business men, just when the D.H.18s were coming into use and were proving themselves to be a paying proposition.

During the fine weather late in the year there was actually more traffic than A.T. & T. Ltd. and Handley Page Transport Ltd. and the Instone Air Line could handle with their available machines. And this in spite of high fares which ought to have made the air journey prohibitive. But there was not enough profit in the business to tide over the Winter. Consequently everybody shut up shop.

To-day, with fares reduced to £6 6s., and in spite of the check which any business receives from being closed and re-opened, the number of passengers as shown by the traffic returns published in the Civil Air Traffic pages of this paper, is already enough to pay for the running of the machines, apart from receipts from goods and mails. And, be it remembered, the machines now in use are far from being of truly commercial types. With real commercial aeroplanes and fares reduced to the level of rail and boat fares the London-Paris air route will be a very paying line indeed.

### Why the Cross-Channel Routes?

Captain Sayers' argument that slow air traffic in places where there are no railways will pay better than the London-Paris route is quite correct. But the London-Paris, London-Brussels, London-Berlin, London-Amsterdam, and other such main-line routes can be made to pay handsomely. And they are far more important to the progress of Commercial Aviation than are any others.

An air line from Toronto to Hudson's Bay might pay 1,000 per cent. and the world at large would care nothing about it, however satisfactory it might be to those able gentlemen who run the Canadian Air Board—would that we had a few of them over here. But let a London-Paris air line declare a 5 per cent. dividend in 1923, as a sign of what is to come, and the whole financial strength of the world will rush to support Commercial Aviation.

The Million Pound National Air Transport Company would have made such a state of affairs reasonably possible. So now perhaps people may realise what we have lost by the Air Ministry's ill-advised haste in starting the present very temporary arrangement.—C. G. G.

## THE NEW GOVERNMENT APPOINTMENTS.

It was announced on April 2nd that the Cabinet had been entirely reorganised by Mr. Lloyd George, or by those who more or less control him.

Naturally the appointment of Capt. the Hon. F. E. Guest, D.S.O., C.B.E., to be Secretary of State for Air is of the greatest interest to readers of this paper. "Freddy" Guest, as he is familiarly called, was a Captain in the 1st Life Guards, and served on the White Nile in 1900, in South Africa, and in the recent German War. In addition to his British orders he is a Chevalier of the Legion of Honour. He has of late been Patronage Secretary to the Treasury, and much in the entourage of Mr. Lloyd George.

He is a brother of the present Lord Wimborne, who was Lord French's predecessor as Viceroy of Ireland. So far as is known he has not hitherto taken any active interest in aeronautical affairs, which may or may not be an advantage, according to the scope of his intellect.

All will deeply regret that Mr. Winston Churchill is no longer officially concerned with the Air Ministry, and many will be disappointed that the Marquess of Londonderry has not been appointed to be Air Minister. Nevertheless, it is only just that Captain Guest should have a fair run for his money in his new office. Therefore one hopes that everybody in the Royal Air Force and all who are concerned with Civil Aviation will give him their whole-hearted support so that he may have the best possible opportunity of doing good work in the great office to which he has been appointed.

Of the other new Ministers, that one whose actions can most

**CROYDON'S OPPOSITE NUMBER.—A photograph of Le Bourget, the Paris Terminal Aerodrome, taken by Capt. C. H. Brewer with an Aero-Kodak from a Handley Page biplane on the London-Paris service.**

affect aviation is the Rt. Hon. F. G. Kellaway, the new Postmaster-General. Any change from Mr. Illingworth can only be for the better. Mr. Illingworth had great opportunities to help aviation. The permanent Civil Servants of his Department desired to do so, but complained that their political chief frustrated their efforts.

So far as one knows Mr. Kellaway's only interest in aeronautics was when as Deputy Minister for Munitions his output was affected by Zeppelin raids. He then, alone among official people, had the courage to state publicly how much such raids actually cost the country at a time when others foolishly endeavoured to allay panic by scoffing at the raids. His logical and open mental attitude in that matter augurs well for his future.

Moreover, of late Mr. Kellaway has been Parliamentary Secretary to the Department of Overseas Trade, a department of which from one's own knowledge one can say that it is at once the most businesslike, the most courteous, the most enterprising, and the most eminently useful of any Government department within one's somewhat varied experience. If Mr. Kellaway brings to the Post Office the all-round methods of the Department of Overseas Trade it will be a very good thing for the development of Air Mail work.

C. G. G.

## THE DISGRACE OF EASTBOURNE.

Brief reference was made last week to the state of Eastbourne Aerodrome. On arrival there on a machine belonging to the De Havilland Aircraft Company it was found that the aerodrome, which is situate on reclaimed marshland the drainage dykes of which were boarded over during the war, has now been rendered very dangerous for landing.

Air Ministry "Notice to Airmen" No. 135, of Dec. 9th, 1920, stated that this aerodrome was deleted from the list of licensed aerodromes, adding a foot-note to the effect that aircraft attempting to land thereon would also, by force of circumstances, in all probability, be deleted from the ranks of licensed or unlicensed aircraft, unless in the hands of skilful pilots. On arrival there on Easter Sunday one was sufficiently fortunate to have Mr. Ortweiler as pilot, so the De Havilland 9 was not deleted.

What has happened is that all the boards, which at considerable national expense were used to cover up the dykes and so make a number of small dyke-bounded patches into a large and excellent aerodrome, are being, or already have been, removed so that unless there is a stiff wind blowing it is dangerous to land anything more heavily loaded than an Avro

One was told by someone there, who appeared to be a sort of watchman who was roughly the curator of anything curatable that was to be found (which was very little), that during fine week-ends quite a number of machines use this aerodrome as a port of call. This, of course, is quite natural because Eastbourne is one of the few really nice seaside towns. Therefore it seems to be somebody's duty to see that the aerodrome is kept on now that the Eastbourne Aviation Company have relinquished their lease.

Who is the lunatic at large who has ordered the boards to be removed is somewhat doubtful, but it is probably one of three agents (a) the Lands Committee of the Air Ministry, who, like Habakkuk, are *capable* de tout; (b) the Disposals Board, who, even if they are not responsible in this case, have some equally droll acts in their variegated repertoire; (c) the owner, who, being a landed gentry, ought to know better than to leave Eastbourne landed without an aerodrome. Even landowners have a duty to the community at large.

Perhaps when some less daring spirit tries to land on the lawns opposite the Grand Hotel and deletes the effigy of the Duke of Devonshire, to say nothing of some small children and yapping dogs, someone may think fit to restore the boards to the dykes, or at least to construct some wide wooden bridges as did Mr. (now Major) Bernard Fowler before the war.—G. D.

[There comes a time in the lives of all men when one doesn't know "what one can do for one," as it were. As this paper goes to press, the Air Ministry, in its periodical list of Notices to Airmen which are still operative or cancelled, states that "Notice No. 135, of 1920," quoted above, is now cancelled.

This, if it means anything at all, means that Eastbourne Aerodrome is now restored to List C, Sub-section (a) and is again a fully licensed civil aerodrome, suitable for all types.

One hopes that some pilot will choose a windless day and invite some of those responsible for the notices to which reference is made and responsible for the evolutions of the aerodrome, and land them at Eastbourne in either a D.H.9a, a D.H.18, a "Bat" limousine, or some other machine which takes a fair amount of space to land That should stop *them* from laughing in church.

It is possible that after wading through many hundred notices, however, on the hidden word principle, it may be found that the aerodrome is finally deleted.—G. D.]

## BRITISH PILOTS FOR JAPAN,

In the reference to the British ex-R.N.A.S. Missi-on to the Japanese Navy, the names of several officers therein were not given, as at that time their participation in the affair was not known for certain. A further list is as follows:—

Major H. G. Brackley, D.S.O., D.S.C., commanded Handley Page bombers at Dunkirk. Did excellent service in organising bombing attacks. After the war went to Newfoundland to pilot a 4-engined Handley Page across the Atlantic. Machine not being ready when Captain Alcock crossed he, accompanied by Admiral Mark Kerr and crew, made a 12-hour flight from Newfoundland towards the U.S.A. Later he managed the London end of the H.P. Transport Ltd. cross-Channel service, and not only displayed great ability but become immensely popular with all who had anything to do with the line.

Lieut. F. Vaughan-Fowler. Made a high reputation for himself as a pilot during the war. Afterwards joined H.P. Transport Ltd. and made many flights on special service on the London-Paris, London-Brussels, London-Amsterdam and London-Copenhagen routes Particularly distinguished himself by flying from London to Paris in a gale which prevented any of the cross-Channel steamers from crossing.

Lieut. A. G. Loton. Was a valuable seaplane pilot and instructor during the war. Afterwards joined Major Bernard Fowler at Eastbourne and flew various types of seaplanes with success.

## THE TRIALS OF R.36.

On April 2nd the Air Ministry announced that the latest British airship, the R.36, which has been built by Wm. Beardmore and Co. Ltd. at their airship works at Inchinnan near Glasgow, made her maiden flight on April 1st. She left Inchinnan at 15.15 o'clock and landed after a three hours' test at 18.20 o'clock.

The trial was satisfactory.

The R.36, whose civil registration mark is G-FAAF, was designed over three years ago by the Admiralty. She is the first British airship to be adapted for commercial purposes, and has a passenger car fitted with day and night accommodation for 50 passengers.

On Saturday, April 2nd, at 19.40 o'clock, she left Inchinnan for Pulham, Norfolk, where she arrived and was moored, after a leisurely journey, at 12.52 o'clock on Sunday.

There were on board General Maitland, General Brooke-Popham, Director of Research, and General Weir. Flt.-Lieut. A. H. Mann was in command.

The trip was purposely made in a leisurely fashion in order that tests might be made and observations taken. The R.36 can do 66 m.p.h., which will, it is believed, be something nearer 70 when her engines have settled down to working.

On April 5th R.36 appeared over London.

Later on it is intended that the R.36 shall demonstrate her long-distance powers by making voyages to France, the Mediterranean, Malta and Egypt.

## HOW TO DAMN AVIATION.

One learns that a certain joy-ride concern has been behaving itself at a town in the East of England in a way that is not likely to increase public confidence in flying as a commercial enterprise.

The concern in question secured credit from printers, garages, and hotels, and left the town with their bills unpaid after several days' flying.

Even if this is an isolated case, and not their general practice, it might be well for the Air Ministry to take some action, as presumably the question of good moral character arises when licences are being granted either to individual pilots or to air transport proprietors.—G. D.

## THAT TELEPHONE

Once again attention is drawn to the telephone number at Croydon Aerodrome. The numbers given in the telephone book are the numbers of the Trust House and the public telephone box on the Aerodrome. The former do not want to be bothered by people ringing up and asking whether 5s. flights are still on, or where the S.N.E.T.A. machine has crashed, and the latter bell is seldom heard as there is no attendant.

The proper numbers are either Purley 1180, whence inquirers can be put through to the proper quarter, or Purley 1172, which is the office of Basil S. Foster, Ltd., who will be pleased to answer inquiries from passengers, prospective or otherwise.—G. D.

## ANOTHER "CUB."

The firm of D. Napier and Son, Ltd., have successfully given birth to a second "Cub." This was tested late last week, and a third is nearing completion. The original one is expected to be taken away shortly and installed in a large single-engined machine.—G. D.

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# NAVAL AND MILITARY AERONAUTICS.

## GREAT BRITAIN.

### The Colours of the Royal Air Force.

In the *London Gazette* dated March 29th the following official marshalling of the Royal Air Force colours was issued by the College of Arms :—

Light blue, in the dexter canton the Union, and in the centre of the fly of the flag three roundles superimposed, red upon white upon blue.

### R. M. Groves Memorial Prizes for the R.A.F.

The Air Ministry announced on April 1st, 1921, that:—

A sum of money to be expended annually during the next ten years has been placed at the disposal of the Air Council by the generosity of the mother and other members of the family of the late Air Commodore Robert Marsland Groves, C.B., D.S.O., A.F.C., who died last year as the result of an aeroplane accident in Egypt.

The prizes will be known as the "R. M. Groves Memorial Prizes," and are intended to stimulate that fine spirit of esprit de corps and of disinterested devotion to duty which was characteristic of Air Commodore R. M. Groves throughout his service career.

The donor desires that the prizes should be open to all branches and all ranks of the Royal Air Force as a living memorial which may help and encourage others to emulate her son's fine example.

Each prize will consist of a set of bound volumes containing an autograph photograph of the late Air Commodore Groves, and a suitable inscription as to the nature of the prize, the choice of the books (within certain limits) being left to the successful candidates. A grant of money will accompany each prize.

The prizes are divided into four groups :—

1. A Practical Flying Prize open to flight cadets which will be awarded twice annually on the recommendation of the Commandant of the Royal Air Force (Cadet) College to the flight cadet who, on passing out of the college, is the best all round pilot of his term.

The prize will be a set of bound volumes together with the sum of £25.

2. An Aerial Navigation Prize open to officers who attend the aerial navigation course at Calshot, which will be awarded to the officer who passes out highest at the termination of the annual course.

The prize will be a set of bound volumes together with the sum of £30.

3. An Aeronautical Research Prize, open to all serving officers, non-commissioned officers and men of the Royal Air Force, will be awarded to the officer, non-commissioned officer or man who, in the opinion of the Air Council, has done most during the preceding year to advance aeronautical science on the technical and research side.

The prize will be a set of bound volumes together with the sum of £40.

4. Four prizes will also be awarded for an essay—the R. M. Groves' Memorial Essay—on the subject of "A Forecast of Aerial Development," which will be set each year.

The essay, which will be open to all ranks of the Royal Air Force who fulfil the conditions laid down, is to be divided into three parts :—

Part I.—In relation to Imperial defence with special reference to the possibility of maintaining equal or enhanced efficiency while securing economy by transferring some of the responsibilities of the old Services to the Royal Air Force.

Part II.—In relation to civil aviation, exploration, etc.

Part III.—An imaginative resume : Aviation in the next World War.

The conditions are as follows :—(i) All competitors must have made a cross-country or overseas flight of at least 100 miles either as pilot or observer or in some other Service capacity. (ii) Papers are limited to 10,000 words. (iii) Papers must reach the Air Ministry before April 1st in each year, except for this year, when the date is Oct. 1st. (iv) The papers will be adjudged by a committee chosen by the Air Council and comprised of three members, of whom one at least will be of the rank of squadron leader or junior. The Chief of the Air Staff will act as referee. (v) In each year the names of the prize winners for that year will be published in the Press. (vi) The prize winners for any year will, in that year, appear in the R.A.F. lists as the R. M. Groves Memorial Prize winners. (vii) The essays will be submitted in triplicate and must be typewritten. (viii) Every competitor must use a nom de plume, the actual essay bearing no indication of the name of the author. A sealed envelope containing the name, initials, rank and station of the author, and having the nom de plume written on the outside, will accompany each essay. (ix) A competitor may give free scope to his imagination. H. G. Wells' "Anticipations" and "The Green Curve," and other stories included in the book of that name by "Ole Luk Oie," may be taken as a fair model of what is expected. (x) All rights of publication rest with the Air Ministry.

The prizes are :—1st prize, books and £30; 2nd prize, books and £20; 3rd prize, books and £10.

In addition a special prize of £10 will be awarded for that part (either I, II, or III) of any individual essay, other than those of the 1st and 2nd prize winners, which shall be deemed by the judges to be the most striking and original.

### The Air Council and Renfrew Aerodrome.

Judgment was issued by Lord Ashmore at Edinburgh yesterday in the action by the Air Council against F. D. Cowieson and Co., Glasgow, the contractors for the Renfrew aerodrome. The Air Council sued for £49,908, alleged to have been overpaid to the contractors, and the hearing of the case took 26 days. Lord Ashmore had decreed against the defendants for £1,000 and otherwise absolves them, finding them entitled to costs, but reserving questions as to these.

In his Lordship's opinion the allegations of the plaintiffs as to the absence of supervision and wanton waste were not only not proved, but were disproved, and, with a single exception, not one of the various irregularities alleged had been established on the evidence. Instead of Mr. Cowieson having been indifferent or careless about the work, the evidence had disclosed a record of constant care and consistent efforts to effect economy. The one irregularity established consisted of a foolish and improper use of fictitious names in the wages sheets, and the abuse of that practice by dishonest appropriation of wages never earned. That practice had reference to the payment of extra money for "dirty work." Dishonest appropriation of money on the part of some of the employees did go on for several months, but not with Mr. Cowieson's approval, and he assessed the amount at £1,000. It was apparent that Mr. Cowieson did spend substantially the whole £314,000 of Government money on material and wages in connection with the contract.

### A Fatal Accident.

Flying Officer Hemsley, R.A.F., and Mr. E. Fenton-Terry, a civil assistant, lost their lives as the result of an aeroplane accident at Bromley on March 31st.

On a D.H.4, they left Biggin Hill aerodrome on a navigation test, but when the machine reached a height of 600 feet the engine cut out. The pilot dived to pick up his engine, and succeeded, only for it to cut out again. In diving again he struck the ground at the foot of the valley at Biggin Hill.

Flying Officer Hemsley had apparently been instantly killed, but Mr. Fenton-Terry, although terribly injured, was still alive. On removal to Biggin Hill Cottage Hospital it was found that both legs and jaw were fractured and his left side much torn. He died later in the evening.

### The W.R.A.F. Old Comrades Association.

The annual meeting of the above Association was held at Birkbeck College on April 2nd, 1921, 200 members being present.

The President, Dame H. C. I. Gwynne Vaughan, D.B.E., in the course of her report, said that the General Committee had, on the strong recommendation of Air Marshal Sir H. M. Trenchard, decided that the Association should become affiliated with the Service Women's Association, thus becoming entitled to a subsidy from the Canteen Funds.

She also spoke about rest homes, summer camps, a non-residential club, and the proposed Reserve of Women, concluding with a generous appreciation of the reports of the doings of the Association which have appeared in this paper.

The Treasurer reported that the receipts for the year were £309 12s. 8d., and the expenditure £466 5s. 7d.

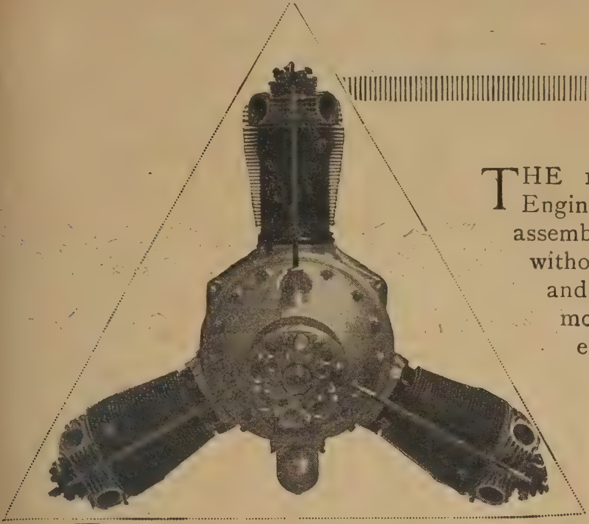
The Secretary reported that the total membership stood at 1,800, an increase of 744 on last year. She also said that eight new branches had been opened, including one for overseas members. During the year financial assistance had been given to 25 members and employment found for 51 of the 84 applications.

A dance at the Westminster Dragoons' Hall followed the meeting and was attended by about 300 members and their friends.—C. M. S. H.

## JAPAN.

### Aeronautical Missions to France, Germany and England.

The Tokio Asahi, a Japanese newspaper of respectability, the news of which is decently obscured in the mysteries of Japanese type, announced recently that a military aviation mission consisting of Captain Oseki (Aviation School), Lieut. Hiruga (Balloon Corps), and a subaltern as yet unnamed, is to proceed to France, Germany and England to study the various kinds of gas and the construction of aeroplane engines. They will remain in Europe three years and will act as Government agents in the purchase of aeronautical material. Captain Oseki goes to France, Lieut. Hiruga to England, and the unnamed one to England.



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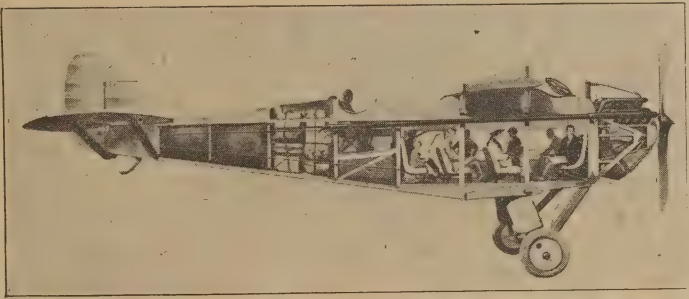

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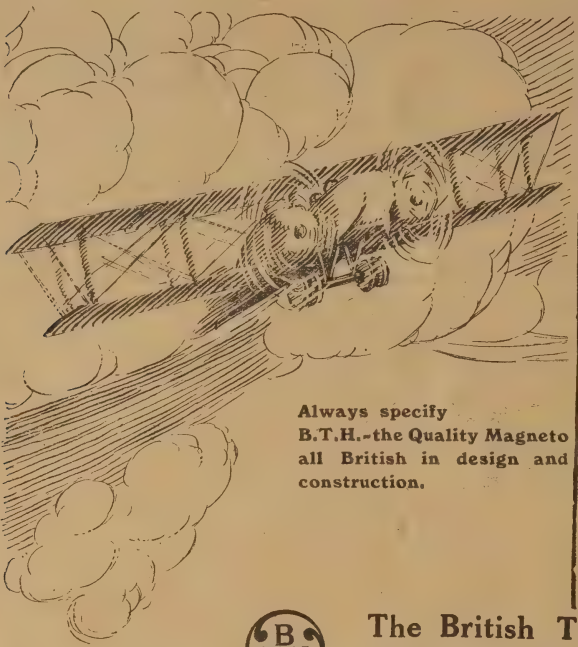

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# AERONAUTICAL ENGINEERING

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INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

Such details as are available as to the new French subsidies for Commercial Aviation are printed below, together with comment upon the effect of the various provisions. The effects of the regulations cannot accurately be predicted in the absence of further data, but it is obvious that the new scheme is not an effort to encourage a sound development of commercial aviation, but rather one to provide a camouflaged weapon of war.

A note concerning the equipment of the Supermarine flying boats which are to undertake a survey of the delta of the Orinoco in search of oil will be found on page 328.

---

The results of American Air Service tests on a Junkers six-seater monoplane give interesting information as to the performance and the flying qualities of this type of aircraft. (Page 334.)

## THE FRENCH SUBSIDIES.

The Department of Information, the Air Ministry, has just issued a *communiqué* which gives the regulations for the new French subsidies. The *communiqué* is reproduced below with interspersed comments upon the effect of the various regulations. The *communiqué* itself is set back from the margin of the column, the remarks thereon are set across the whole width.

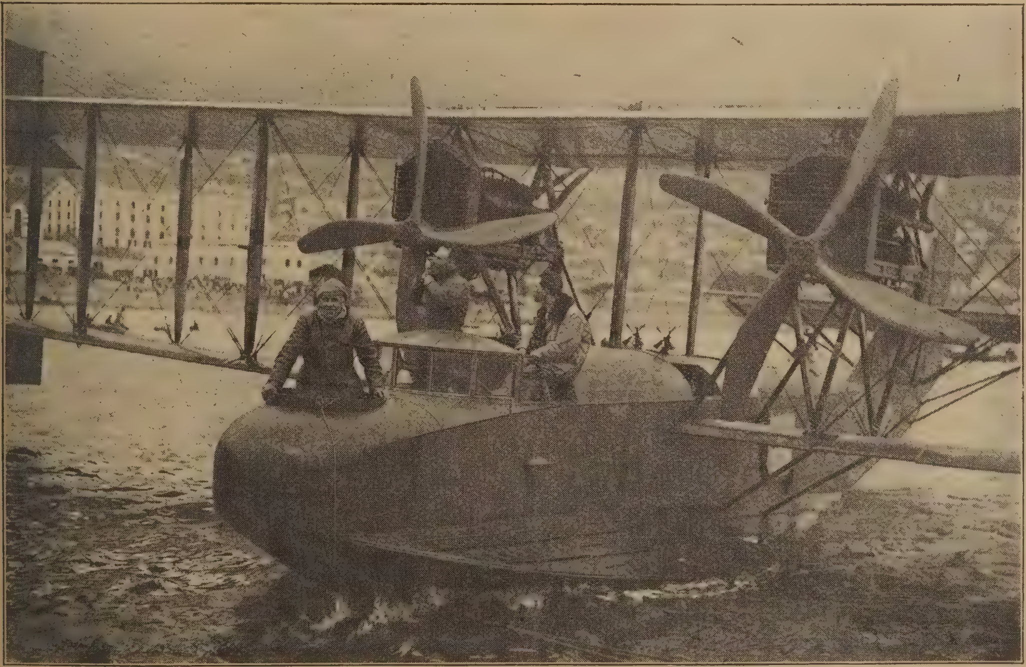
### THE REGULATIONS.

The sum of 33,215,000 francs (at par exchange £1,328,600) has been voted for civil aviation subsidies in France during the financial year 1921-22

The subsidies to be granted are of two kinds :—

(a) a subsidy for purchase, and
(b) a subsidy for public transport.

In all cases the subsidies will only be granted, subject to the approval of the Under Secretary of State for Air, to French subjects and companies employing French material and French pilots and personnel.



THE FIRST PORTUGAL-MADEIRA FLIGHT.—An F.3 (2-375-h.p. Rolls-Royce "Eagles") manned by Captain-Lieut. Sacadura, in command, Lieut. O. Betencourt, second in command, Captain C. Contenha, navigating officer, and Roger Soubiran, mechanic, all of the Portuguese Navy, which flew from Portugal to Madeira on March 22nd. They left Lisbon at 10.30 a.m. and arrived at Funchal at 16.00 p.m., having followed the shipping route, a distance of about 530 nautical miles, in 5½ hours. The machine used was one of a batch purchased in this country since the Armistice, and rebuilt by the Fairey Aviation Co., Ltd., at Hamble. The arrival caused a great amount of excitement, as it was the first aeroplane of any kind to arrive in Madeira.

The total effect of the new regulations will be considerably to increase the amount of the subsidy. The purchase subsidy, as also the subsidies for depreciation, crew, and petrol, can be obtained without carrying any commercial load.

### Method of Allocation of Subsidies.

(a) Subsidy for Purchase.—This subsidy consists of a grant by the State of half the value of machines employed for touring and transport by air and will not be given to any business connected directly or indirectly with the sale of aeronautical material.

The types of machine to be subsidised and the value thereof will be fixed by the Under Secretary of State for Air. No subsidy will be given for aircraft built before July 1st, 1920, and aircraft bought before January 1st, 1921 which conform to the conditions laid down will receive subsidies reduced in proportion to the number of hours already flown.

The purchaser receiving a subsidy must undertake: (1) That he will keep the machine in good condition and report to the Under Secretary of State when it is unserviceable for any reason. (2) That the machine does not leave French territory without the consent of the Under Secretary of State. (3) That he will not sell the machine without the consent of the Under Secretary of State.

A list of the types of machines to be subsidised will be published later.

The information given by the *communiqué*, though interesting, is indefinite, because there is no information as to the actual values to be assigned to the constants employed.

In particular regard to paragraph (a) it is curious to remark that the subsidy for the purchase of machines is said to be a grant of one half of the *value* of the machine. As elsewhere price is used as a basis for depreciation grants, and price is for this purpose *a price fixed by the Under Secretary of State for Air*, it would appear likely that this subsidy by no means necessarily amounts to a grant of half the cost of the machine, but may vary according to the official estimate of the value for defence purposes, of the type concerned.

Despite the very wise provision that no subsidy of this class shall be paid to any business connected directly or indirectly with the sale of aeronautical material, this fact would appear to open up possibilities of continual intrigue on the part of aircraft manufacturers to induce the authorities to set a high value upon their manufactures.

The provision would also appear to exclude from the scope of the purchase subsidy the existing French transport lines as they are largely backed by the French manufacturers.

In addition very few of the machines now in use by the French firms can come under the limits for date of manufacture and purchase. Apparently this only affects the purchase subsidy, and such machines are eligible for all the other forms of subsidy.

(b) Subsidies for Transport.—The subsidies for transport are granted only to legally constituted French companies, carrying out regular air services of recognised utility. The value of the subsidy varies according to the nature of the enterprise, the type of material employed, the regularity of the service, and the commercial turnover.

(i) For Time and Distance Flown, in Francs per Flying Hour.

(1) Depreciation $$\tfrac{1}{2}\left(\frac{P + 1.5\,p}{200}\right) \quad \text{for land machines.}$$

$$\tfrac{1}{2}\left(\frac{P + 1.5\,p}{150}\right) \quad \text{for seaplanes.}$$

Here P and p are prices fixed by the Under Secretary for machines and engines respectively. The actual subsidies granted are to cover depreciation at the price fixed, corresponding to a life of 400 flying hours for an aeroplane, and of 266 2/3 hours for its engine. For a seaplane the equivalent lives are 300 hours for machine and 200 hours for engine.

(2) Crew $$0.10\left(Em + \frac{nHP}{2}\right) \quad \text{for land machines.}$$

$$0.40\left(Em + \frac{nHP}{2}\right) \quad \text{for seaplanes.}$$

(Em is the average length of a stage.)

The value of the subsidy for crew in francs for any one journey as given is one tenth of the sum of the average length of a stage in kilometres, and of one half of the h.p. of the machine multiplied by the time taken in flying the route. For instance if a route consists of two stages, one 300 km. and the other 150 km., and that route is flown by machines of 300 h.p. at 150 km.p.h., the average length of stage is

$$\frac{300 + 150}{2} = 225 \text{ km.}$$

The flying time is 3 hours. The subsidy earned on one journey under these conditions is

$$0.10 \times \left(225 + \frac{300}{2}\right) \times 3 = 0.10\ (375) \times 3$$
$$= 112.5 \text{ francs.}$$

A machine of identical type flying only over the 300 km. stage at the same speed would receive a subsidy based on an average stage of 300 km. presumably, and would receive as subsidy for one journey

$$0.10\left(300 + \frac{300}{2}\right) \times 2 = 90 \text{ francs.}$$

Both as to rate per hour, which is the normal method of reckoning cost of crew, and on rate per kilometres flown, the short journey of one stage is more highly subsidised on this account than is the journey extended to the second 150 km. stage.

Also the slower a given journey is flown the greater the subsidy granted in respect to crew.

(3) Transport $$\frac{KV^2T}{1000} \quad \text{for land machines.}$$

$$\frac{1.6\,KV^2T}{1000} \quad \text{for seaplanes.}$$

The subsidy given under the heading of transport obviously depends entirely upon the constant K. This, according to the statement hereafter, depends on the average distance of flight, presumably the whole route distance and the nature of the route, whether all over France, over France and French Africa, or International. It is 60 per cent. greater for seaplanes than for land machines. The basis of the expression is $KV^2T$. K, as mentioned above, is a constant and depends on distance. V is the speed of the machine, and T is the number of tons of commercial load carried. Therefore there is a definite direct incentive to carry the maximum cargo of paying goods, but the subsidy increases as the speed increases—both per hour of flight and per kilometre flown. Other things being equal the subsidy per ton kilometre of commercial load increases directly as the speed.

(4) Petrol $$\frac{0.250\,nHP}{0.65} \times \frac{p'}{2} \quad \text{for stationary engines.}$$

$$\frac{0.320\,nHP}{0.65} \times \frac{p'}{2} \quad \text{for rotary engines.}$$

The Petrol subsidy takes the form of half the cost of petrol at a price fixed quarterly, upon an assumed consumption per h.p. hour.—Taking it that the price is fixed in terms of francs per litre, the consumption assumed is 0.384 litres per h.p. hour for stationary engines, and 0.49 litres per h.p. hour for rotaries; (0.6 and 0.77 lb. per h.p. hour).

### The Symbols used in the Regulations.

Where P is the price of the aircraft as fixed by the Under Secretary of State for Air.

Where p is the price of the engine as fixed by the Under Secretary of State for Air.

Where p′ is the price of the petrol, to be fixed quarterly.

Where Em is the average length of a stage on the route flown.

Where nHP is the horse-power.

Where K is a co-efficient depending on the average length of a flight and on whether the route is entirely in France, crosses over French Africa, or is international.

Where T is the number of tons of commercial load carried.

Where V is the speed in kilometres per hour at 2,000 metres.

(ii) On Turn-over.

This subsidy will be granted at the rate of 0.75 francs per passenger-kilometre and 0.005 francs per kilogramme-kilometre of goods, carried at fares and rates approved by the Under Secretary of State for Air.

The subsidy on turnover calls for little comment. In amount on the London-Paris route, taking the distance as 240 miles or say 385 km., it amounts to roughly 287 francs per passenger and to 1.92 francs per kg. of goods. Taking the average passenger as 75 kg., the passenger is subsidised at twice the rate per kilo allowed for goods.

### Special Conditions Governing Grant of Subsidies.

(i) The company must possess a minimum number of machines equal to twice the quotient obtained by dividing by 200 (in the case of land machines) and 150 (in the case of seaplanes) the number of flying hours. (Represented by the total *annual* distance flown by the company's machines at a speed of 130 kilometres per hour.)

(ii) The company must employ as a minimum the following personnel:—

(a) One pilot for every three machines.

(b) One mechanic for every 300 h.p. utilised.

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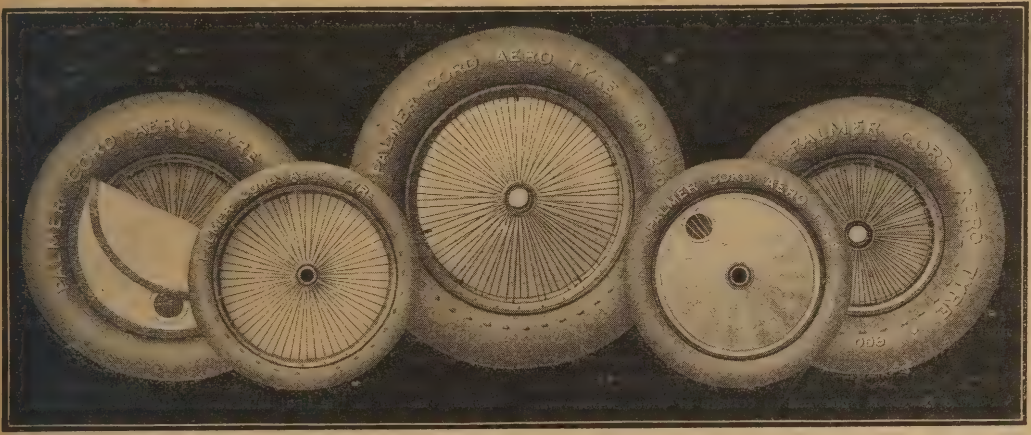

## STANDARD SIZES

| Tyre Sizes | Wheel No. | Hub |  | Track Line |
|---|---|---|---|---|
|  |  | Length | Bore |  |
|  |  | m/m | m/m | m/m |
| 300 × 60 | 16 | 111.12 | 25.4 | Central |
| ,, | 17 | 72.39 | 12.7 | Central |
| 450 × 60 | 30 | 89. | 31.75 | Central |
| ,, | 131 | 130. | 38.09 | Central |
| 575 × 60 | 21 | 160. | 28. | Central |
| ,, | 34 | 150. | 31.75 | 104/46 |
| ,, | 111 | 150. | 38.09 | 104/46 |
| 650 × 65 | 78 | 178. | 44.45 | 132/46 |
| ,, | 79 | 178. | 44.45 | Central |
| ,, | 100 | 178. | 38.09 | 132 46 |
| ,, | 101 | 178. | 31.75 | 132/46 |
| 600 × 75 | 21 | 160. | 28. | Central |
| ,, | 34 | 150. | 31.75 | 104/46 |
| ,, | 111 | 150. | 38.09 | 104/46 |
| 700 × 75 | 78 | 178. | 44.45 | 132/46 |
| ,, | 79 | 178. | 44.45 | Central |
| ,, | 100 | 178. | 38.09 | 132 46 |
| ,, | 101 | 178. | 31.75 | 132/46 |
| 700 × 100 | 77 | 178. | 44.45 | 132/46 |
| ,, | 92 | 185. | 55. | 135/50 |
| ,, | 95 | 185. | 55. | Central |
| ,, | 96 | 178. | 55. | 132/46 |
| ,, | 99 | 178. | 38.89 | 132/46 |
| ,, | 112 | 150. | 38.09 | Central |
| 650 × 125 | 119 | 178. | 55. | 132/46 |
| 750 × 125 | 77 | 178. | 44.45 | 132/46 |
| ,, | 92 | 185. | 55. | 135/50 |
| ,, | 95 | 185. | 55. | Central |
| ,, | 96 | 178. | 55. | 132/46 |
| ,, | 99 | 178. | 38.89 | 132 46 |
| ,, | 112 | 150. | 38.09 | Central |
| 800 × 150 | 82 | 185. | 55. | 135/50 |
| ,, | 85 | 185. | 55. | Central |
| ,, | *36 | 185. | 55. | 135/50 |
| ,, | *40 | 185. | 60.32 | 135/50 |
| ,, | 152 | 185. | 66.67 | 135/50 |
| 1000 × 150 | 131 | 220. | 66.67 | Central |
| ,, | 102 | 185. | 55. | 125/60 |
| 1000 × 150 | 141 | 250. | 80. | Central |
| ,, | 201 | 185. | 60.32 | 125/60 |
| ,, | 209 | 185. | 55. | Central |
| ,, | 210 | 185. | 60.32 | Central |
| 1000 × 180 | 148 | 220. | 80. | Central |
| ,, | 149 | 185. | 55. | Central |
| 900 × 200 | 107 | 185. | 55. | Central |
| ,, | 108 | 185. | 55. | 125/60 |
| ,, | 128 | 220. | 66.67 | Central |
| ,, | 137 | 250. | 80. | Central |
| ,, | 202 | 185. | 60.32 | Central |
| 1100 × 220 | 134 | 220. | 66.67 | Central |
| ,, | 136 | 250. | 80. | Central |
| 1250 × 250 | 133 | 250. | 80. | Central |
| 1500 × 300 | 115 | 304.8 | 101.6 | Central |
| ,, | 126 | 304.8 | 152.4 | Central |
| 1750 × 300 | 139 | 400. | 152.4 | Central |

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(iii) The rates and fares which may be charged by companies are fixed according to the following tariff laid down by the Under Secretary of State for Air :—

Passengers : 0.8 francs per passenger-kilometre.
Goods : 0.015 francs per kilogramme-kilometre.

### Reduction of Fares on Certain Routes.

In effect, the new subsidies will produce the following reductions in passenger fares (for flying only, not including terminal charges) :—

Single fare Paris-London reduced to 300 francs.
Single fare Paris-Strasbourg reduced from 500 to 150 francs.
Single fare Paris-Prague reduced from 1,500 to 500 francs.

The conditions as to number of machines is expressed in curious terms. Why this statement should take the form of "twice the quotient obtained by dividing by 200," rather than simply the quotient dividing by 100 is difficult to see. However, it is in entire accord with the very unnecessarily involved form of all the expressions used in the official statement, and may be taken as an index to the state of mind of those responsible for the drawing up of the scheme.

In effect it involves the maintenance by the subsidised company of 1 land machine for every 100 hours of flight at an average speed of 130 km.p.h., which is in effect 1 machine for every 13,000 km. flown.

The period over which this aggregate is to be reckoned is nowhere stated, but it is obviously one year. With only one machine actually flying on any one day, and only making one flight on each day, over 300 London-Paris or vice-versa trips would be made per annum equal to 115,800 km. reckoned at just about 900 hours flying on the subsidy basis. Therefore if the period fixed is one year it would need 9 aircraft kept in flying order for each one continuously in service to qualify for the subsidy.

And even this is on a very conservative basis as to the flying possible by one machine. With reserve crews one machine can easily do a double trip on this route per day, and the effect of such use would be to double the number of machines which must be maintained. Very obviously this particular subsidy will tend to penalise the full use of the capacity of the material equipment of a subsidised line.

The sub-paragraph (a) in section ii of the regulations calls for at least 1 pilot for each 3 machines which again points to the idea that the stock of machines called for is large compared to the use made of them, as does the following requirement as to mechanics made in sub-paragraph (b).

The rates and fares chargeable call for little comment.

### Some Conclusions.

In view of the absence of any information as to the values which are to be given to certain figures left to the discretion of the French Authorities, it is difficult to arrive at a quantitative conclusion as to the probable effect of these subsidies.

One fact seems fairly clear and that is that the aim underlying the scheme is not that of encouraging the development of a sound commercial air transport industry, but rather that of providing for the purposes of political window dressing, a vast reserve of aircraft of one type or another, to be presented to the public of France as an effective defence force.

This is the only possible interpretation of the clauses as to numbers of machines to be maintained, and although it is possible that the very heavy payments which are to be made to air lines, and the very low charges which are compulsory, may temporarily lead to a large expansion of air traffic on French lines, the ultimate result, if this form of subsidisation is maintained, must be stagnation.

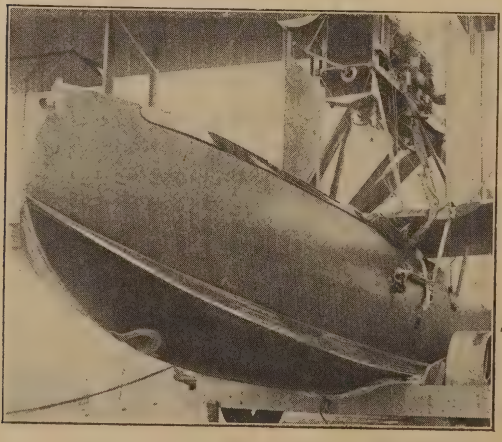
No really great development can occur if air lines are to be prevented from making the fullest possible use of the capital represented by the aircraft owned by them, and the regulations above are absolutely rigid on this point. If a line doubles the number of hours flown per machine per day it must either at the same time double the number of machines in stock or lose the subsidy.

## OIL PROSPECTING WITH FLYING-BOATS.

An announcement appeared in certain of the London journals of March 19th last to the effect that a British oil concern were sending two flying-boats to survey the delta of the Orinoco River (Venezuela).

The actual work of carrying out the survey is being undertaken by the Bermuda and West Atlantic Aviation Co., Ltd., on behalf of the Oil Company and two special Supermarine flying-boats have been fitted out for the purpose. It appears that oil-bearing lands in this part of the earth are distinguished by the partial destruction of the vegetation, and it is believed that an aerial photographic survey of the region will afford a rapid method of both locating oil-fields and of discovering the most suitable forest paths and waterways for an approach to the fields. The only alternative methods of exploration involve great dangers and the expenditure of much time. The district to be explored has never been covered by white men, and it is hoped that the survey will be completed in a month or two.

The flying-boats to be employed are standard Mark 2 "Channel" type Supermarines, fitted with Siddeley "Puma" engines, and equipped with special camera gear. The fore part of the hull has been modified for this purpose. An opening is cut in the boat bottom to allow the camera lens a view, and this hole is fitted with a water-tight manhole cover secured by a kind of breech block action. The camera itself is arranged to be lowered into position, or raised, and the manhole closed by very simple movements and in a very short time. Special racks for the photographic plates, insulated against vibration, are fitted.


The bows of one of the Oil Prospecting Supermarines, showing the special camera port hole

The photographer's compartment is divided off from the after part of the hull by a water-tight bulkhead, so that even if the closing gear for the camera port fails the hull remains seaworthy. The photograph shows the position of the camera port.

The two machines have now passed acceptance tests, and are on their way to the scene of the operations.

## SOME AIRSHIP!

According to the *Times* of March 30th, Mynheer A. Boerner, a Dutch designer, proposes to revolutionise aerial travel by means of the new type of airship which he has invented. Briefly, the Boerner airship is a semi-rigid, with a duralumin girder frame and multicellular gasbags. These gasbags are triple-skinned, the hydrogen container proper being surrounded by nitrogen and air chambers.

This arrangement, it is claimed, reduces the loss of hydrogen by diffusion to a great extent, and in the event of the outer cover catching fire, the rush of nitrogen will extinguish the flame as soon as a hole is burnt through.

The proposed ship is to be no small experimental model, but is to have a length of 950 ft., and is to be driven by 32 engines, each of 200 h.p., and is expected to cruise on half-power at 72 m.p.h., carrying 300 passengers.

Apparently some form of swivelling airscrew drive is to be fitted, and the machine is to be capable of landing "without assistance from the ground."

Apparently Mynheer Boerner has escaped from America.

## ?

According to a Reuter telegram, published by several daily papers, it is claimed that certain scientists employed at a Pittsburg steel mill have discovered the composition of the aluminium alloy used by the Germans for the construction of Zeppelin airships.

One hesitates as to whether to describe this statement as merely another index to the characteristic accuracy of our Daily Press in technical matters, or to regard it as a piece of American publicity work gone astray.

Another good effort was that of the *Sunday Pictorial*, which on April 3rd illustrated as an epoch-making American invention made by Admiral Fiske a torpedo-carrying seaplane such as was experimented by the R.N.A.S. before the war and used successfully by the British and Germans.

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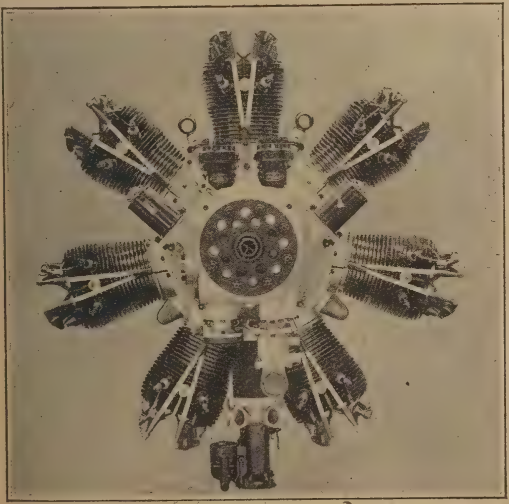

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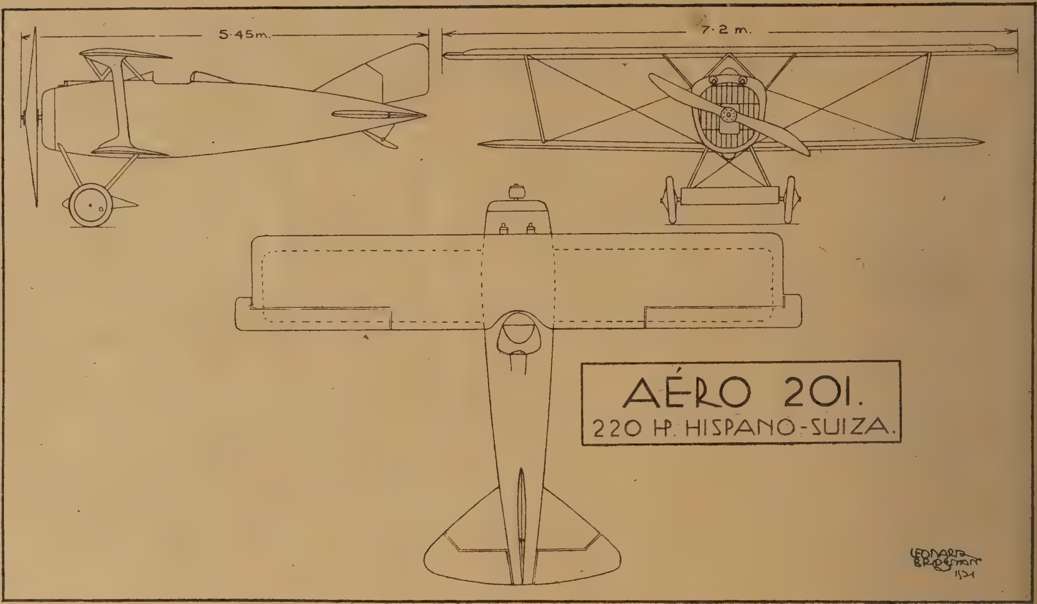
## A NEW SINGLE-SEATER SCOUT.



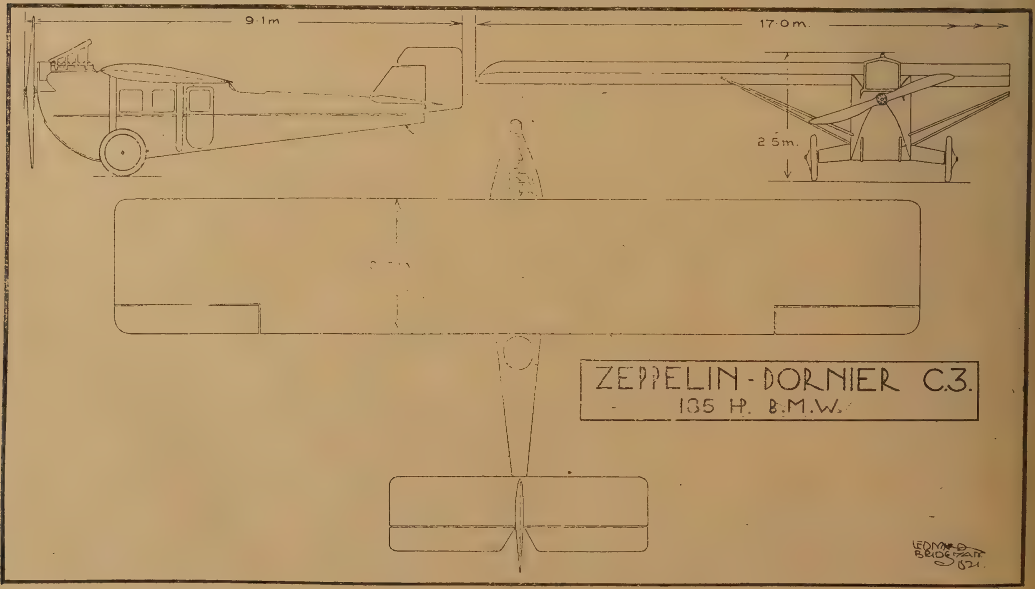
"L'Etablissement Aéro" of Prague have recently produced a small single-seater fighter biplane designed by MM. Husink and Vlasák. The machine is very "Spad-ish" in appearance. The fuselage is of steel construction, fabric covered, and is fitted with a 220-h.p. Hispano-Suiza engine which is entirely carried inside the cowling. The main petrol tank is carried on the axle in a manner similar to that found in the later Fokker biplanes. The planes having a loading of 54 kgs per sq. metre are of orthodox construction, the inter-plane struts being of C-shape. Balanced ailerons, elevators, and rudder are fitted. The useful load is 320 kg., and the weight per h.p. 3.95 kg. A model of this type is being prepared in order to put up a Czecho-Slovakian speed record.

## A NEW DORNIER MONOPLANE.

The machine shown in the attached scale drawings is to the designs of Ing. Dornier, and is the first commercial land aircraft built by the Zeppelin Works at Lindau. It is known as the Do C3.

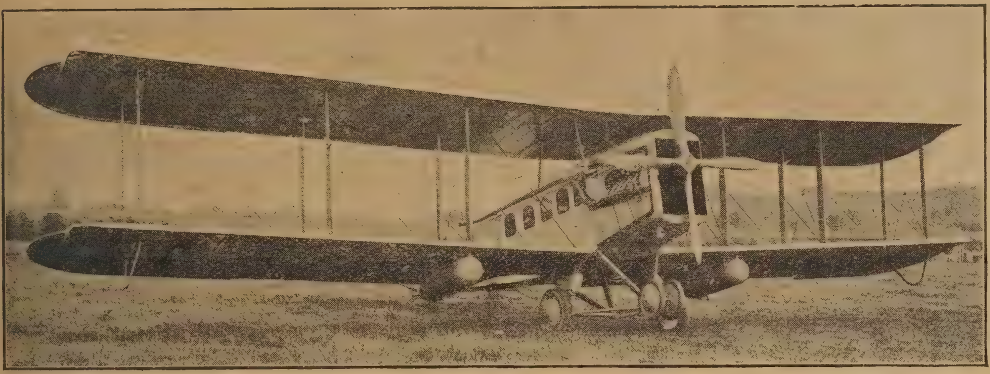
Like all the Dornier designs the machine is of all-metal construction, high tensile steel and duralumin being mainly used in the construction.

The wing, which is of characteristic thick section, is built in one piece, and is applied to the upper surface of the fuselage. It is supported, at about one third of the half span on each side, by two steel stays, from the bottom of the fuselage, and must therefore be regarded as largely of the cantilever type. It is curious that over the whole span the wing is apparently of uniform section, a fact which would appear to indicate that simplicity of construction has taken precedence of aerodynamic efficiency. The wing covering is entirely of thin duralumin plate, the internal structure apparently is of steel.



# WESTLAND

(REGISTERED TRADE MARK)



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The fuselage is nearly 2 metres deep at the wings and contains a comfortably fitted cabin for six passengers, with side door and six windows. The pilot's cockpit is aft of the trailing edge and open.

The undercarriage is attached directly to the bottom of the fuselage, and is of curious form. Two deep cantilever brackets project from the body, and apparently hinged axle tubes are contained within and are sprung at the outer extremities.

The tail unit is normal in form.

The engine is installed high up in the nose of the fuselage, and the very sharply curved up lower surface of the fuselage below is fitted with what appear to be rubbing shakes, presumably for use in the event of the machine going over onto its nose.

The main particulars of this machine are appended.

SPECIFICATION OF THE ZEPPELIN DO C3.

| | | | |
|---|---|---|---|
| Span | 17 m. | Weight loaded | 1,830 kg. |
| Length overall | 9.1 m. | Loading | 38.8 kg. per sq. m. |
| Chord | 3 m. | Lower loading | |
| Height | 2.5 m. | | 9.9 kg. per h.p. |
| Total wing area | 47 sq. m. | Engine | B.M.W.3a, 185 h.p. |
| Weight empty | 1,100 kg. | Speed | 170 km.p.h. |
| Load, including fuel | 730 kg. | | |

## THE LACHMANN WING.

In a foreword to a translation of Mr. Handley Page's paper on the divided wing published in *Flugsport* of March 6th, the translator (Herr Lachmann) comments on the different development of the H.P. wing as compared to his own, the first H.P. wings consisting of a main aerofoil with at first one and then several small aerofoils added on forward, the leading edge of the small aerofoils being on the chord line except in the last form (R.A.F. 19), where it comes into the profile curve and then the profile corresponds exactly to the definition in the German Patent claim of 1918 of a profile "composed of several sectional aerofoils in series, each having a true aerofoil profile."

As regards Mr. Page's "passing reference" to the Lachmann wing, Herr Lachmann says "Mr. Page gave the lift coefficient of the Lachmann wing model as 0.5 without comparison with the coefficient of the basis wing (the value of 0.7 mentioned by him is only the "value expected" and therefore not the result of measurements). The result of the English measurement is somewhat astonishing as the tests of a Lachmann wing at the Göttingen Test Institute (carried out since the first notice in the Press of the German invention) showed that an increase of the lift coefficient of about 30 per cent. was obtained with the slots open. The model tested at Göttingen was established fairly accurately according to the original patent specification drawing as far as the principles concerned went, although the profiles of the sectional aerofoils were rounded off rather more favourably according to general aerodynamic principles and the width of the slots was somewhat increased. It would seem that in England the rough form and dimensions of the patent specifications drawing were adhered to with excessive accuracy of set purpose."

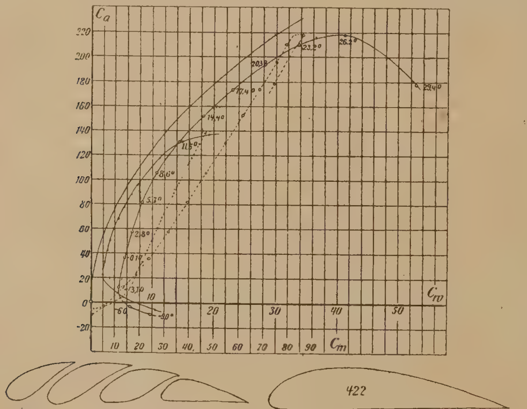

**Chart of test results of the Lachmann wing and of the Göttingen aerofoil 422.—The value Ca. at 26.2° of 218 is equal to a lift coefficient of 1.09 in British standard units.**

In conclusion Herr Lachmann alludes to Mr. Page's reference in his reply to the Continental claim to priority, as reported in THE AEROPLANE, No. 9, p. 210, and gives a full translation of the editorial note thereto, adding "Comment on this just remark (proving that the English technical Press is concerned solely with the technical aspect of questions) is unnecessary. If efficiency tests are to be made with models based on patent specification drawings no good results will ever be attained in any branch of engineering as an inventor will never reveal in this way the most favourable practical form of his invention."

## NOTES FROM AMERICA.

### Aircraft v. Battleships.

Following the wordy warfare raged between the American upholders of the ability to destroy battleships, and those who held that the Air Services could not be expected to handle their bombs any more accurately than they handled facts, it has been decided to carry out extensive tests in the use of aircraft for attack on ships of war.

These tests are to be carried out between June 1st and July 15th, 1921.

The old U.S. battleship *Iowa*, which is fitted with wireless control, will form one target. The tests made against her will be carried out by aircraft armed with dummy bombs. The tests will take place in a zone between 50 and 100 miles from the coast between Cape Hatteras and Cape Heulopen, and from "zero hour" that ship will steam at maximum practicable speed in the general direction of the shore. At the same time the assembled aircraft are to leave their shore base to locate and attack the target. The *Iowa* will be manœuvred to attempt to dodge the bombs.

A careful plot of the fall of all bombs is to be made, to determine the probability of effectively bombing a ship under way.

In addition certain ex-German warships are to be attacked and if possible sunk by live bombs from aircraft. A destroyer is to be attacked by 230 lb. Mark I bombs, and the light cruiser *Frankfurt* is to be attacked, firstly with 250 lb. heavy case bombs, and secondly with 520 lb. heavy case bombs. Finally the battleship *Ostfriesland* is to be bombed with 250lb., 520 lb., and 1,000 lb. bombs. Only two 250 lb. bombs or one of the heavier bombs are to be dropped at any one attack, and examination of damage done is to be made after each hit. Attacks are to be continued till at least three hits with 250 lb. bombs, two with 520 lb. bombs, and one with 1,000 lb. bomb have been made. If the ship remains afloat after this, she is to be sunk by gun-fire from a ship with 14 in. guns, at a range not less than 18,000 yards.

### The Reduction of Landing Speeds.

In a technical note (No. 54) recently issued by the American National Advisory Committee for Aeronautics, Mr. F. H. Norton, of the Aerodynamical Laboratory, discusses the factors which determine the minimum speed of an aeroplane. In it is pointed out that although it is usually stated that at the minimum flying speed the maximum lift of the wings is developed, in fact this is rarely the case, and that many machines cannot reach an angle of incidence within 5 deg. of the actual stalling point of their wings.

It is pointed out that although, generally speaking, the landing speed deduced from the wing loading and from the maximum lift coefficient obtained on models of the wings agrees fairly closely with the landing speed actually obtained in practice, this is purely a coincidence due to the added lift of the body, tail plane, etc., and not evidence that the full lift coefficient is developed.

Scale effect, aspect ratio, and the lift of surfaces other than wings all have an effect tending to raise the effective lift of the complete machine above that of the model wings alone, but in practice such additional lift can rarely be used, and in consequence machines have practically invariably a practical landing speed several miles per hour faster than the minimum speed needed for support.

The main reason for this effect is that of lack of control at low speeds. Both longitudinal and lateral controls enter into the question.

Over the normal range of flying angles, the movement of the centre of pressure is such that it tends to exaggerate any change of incidence which occurs, and a tail plane is necessary to give stability. Near the stalling angle this movement reverses and tends to resist an increase of angle. If, therefore, the machine has a tail plane adequate to give stability over the normal flying range of angles, at very coarse angles the stability becomes excessive and the control very heavy. According to the writer many machines do not possess sufficient elevator control to force them to the angle of minimum speed.

In addition is the well-known difficulty of lateral control. As the angle of incidence reaches the neighbourhood of stalling point, the effect on the lift of pulling down one aileron becomes small and may entirely reverse.

Thus the majority of machines lose aileron control at a speed appreciably higher than that corresponding to the maximum lift of the wings, and run into danger of spinning. A skilled pilot may overcome this to some extent by the use of the rudder, causing the machine to yaw and thus giving a lateral rolling couple, and an instance is quoted of one pilot who could not control a machine at any speed below 43 m.p.h.,

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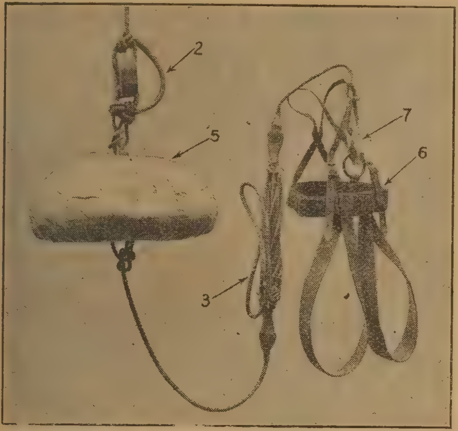

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whereas a second pilot, by skilled use of the rudder, was able to fly at 40 m.p.h. on the same machine at the same total weight.

The problem of reducing landing speeds is, therefore, to some large extent, one of improving longitudinal and lateral controls at low speed.

The use of very large elevators and ailerons is no solution, as large elevators at high speeds might be dangerous, and in any case would be very heavy in operation. The second objection applies also to large ailerons, with the further drawback that at the angle at which reversal of the control occurs they would add to the danger of spinning.

## A Test of the Junkers Six-Seater.

Results of tests carried out on one of the six-seater Junker machines acquired by the American Government have just been published in the American journals. These tests have been carried out by the official American test flight at McCook Field, Dayton, Ohio, and it is fairly safe to assume that the results attained are nearly comparable in accuracy with tests made at the British official experimental stations.

The performances are shown in the attached table :—

| | Climb. | | Level flight. | |
|---|---|---|---|---|
| Standard altitude, ft. | Time to climb, mins. | R.P.M. | Speed, M.P.H. | R.P.M. |
| 0 | — | 1,365 | 111.2 | 1,445 |
| 6,500 | 14.4 | 1,365 | 107.2 | 1,435 |
| 10,000 | 27.3 | 1,365 | 102.5 | 1,420 |
| 13,200* | 48.7 | 1,360 | 95.1 | 1,395 |
| 15,900† | — | 1,350 | 67.0 | 1,350 |

* Service ceiling, rate of climb 100 ft. per min.

† Absolute ceiling, figures for speed and r.p.m. are estimated.

Endurance at 10,000 ft. including climb, 7 hrs. 35 min. full throttle. Minimum speed at sea level 52.1 m.p.h.

The machine to which these tests refer was S.L.6 No. P145, of the dimensions and weights given in the specification below.

SPECIFICATION OF JUNKER S.L.6.

Span ..............48 ft. 8 in.
Length overall ...28 ft. 9 in.
Height over airscrew ...10 ft.
Total wing area...417.4 sq. ft.
Total aileron area 32.56 sq. ft.
Tail plane area 28 sq. ft.
Elevator area ......20.88 sq. ft.
Engine ......B.M.W. IIIa —185 h.p nominal
Output ...198 h.p. at 1,400 r.p.m (petrol)
233 h.p. at 1,400 r.p.m. (50 per cent. petrol 50 per cent. benzol).
Weights—
Machine empty ..2,317 lb.
Crew and passengers 655 lb.
Fuel .....................569 lb.
Oil .......................64 lb.
Total ...............3,605 lb.
Loading—
Wings ...8.64 lb. per sq. ft.
Power ...14.8 lb. per h.p.‡

‡ Based on 233 h.p.

The report of the test pilots as to the machine's flying qualities is reproduced verbatim, as it is of some interest.

PILOTS' OBSERVATIONS.

The flying qualities of the JL-6 all-metal monoplane appear new and different when originally flown by pilots familiar with conventional types, but the same general flying principles applying to all aeroplanes govern the flying of the Junker. An exact co-ordination and proportioning of the amount of the controls is required or the aeroplane will side slip or skid badly. It is extremely sensitive in this respect. The rudder and elevators appear and feel too small.

The aeroplane is spirally unstable due to the large fin area toward the tail causing a lifting of the rear of the fuselage in the event of a side slip.

Until familiar with the aeroplane, pilots invariably use too little bottom rudder in making turns. When stalled, both with power and without, the tendency to spin is easily checked, the aeroplane responding readily to the controls.

The JL-6 takes off very slowly, especially when heavily loaded. The tail does not come up until some distance has been travelled. The visibility for the pilot is not good. One side is almost entirely blind and it is difficult to see over the end of the nose. The fact of flying from one side with the other partially blind has a tendency to cause the pilot to fly with one wing low; a very bad feature in landing. The aeroplane has an exceedingly long and flat glide. The absence of wires gives the erroneous impression of slow speed in the glide.

The pilot must be careful in landing. The JL-6 will suddenly drop a wing when flying speed is lost unless care is used to keep the wings parallel to the ground in the glide. A stall landing is hazardous. The aeroplane has a tendency to ground loop in landing or in taxying in a strong wind. It rolls but a short distance after landing. The landing gear effectively cushions the landing shock.

The position of the controls is unhandy, especially for a pilot of medium stature. The distance from the seat to the pedals is too great to permit of their use in a natural position. Operation of these pedals having one end hinged to floor cramps the ankles and leg muscles. The long reach to the throttle and switch does not permit quick action in emergency. The notched push-rod type of throttle makes delicate use difficult. A standard engine throttle is desirable.

A mixture of one-half gasoline and one-half benzol gives the best engine results.

The radiation surface is ample, even in warm weather. The shutter control is quite inadequate. The oiling system caused no trouble.

The maintenance of this aeroplane is, on the whole, very simple, especially in regard to the engine. The mounting gives easy access to spark plugs, distributors, carburetters, etc. The all-metal construction makes a hangar unnecessary for its protection.

Back firing of the engine tended to ignite and explode gasoline from the carburetter which drained into the fuselage through air intakes having no outlet from the fuselage. Efforts were made, which were apparently successful, to eliminate fire hazard by installing air intake pipes leading from the pan under the crank case to the outside of the aeroplane below the engine, thus directing back fire from outside the fuselage.

Breakage of dangerous gas lines was prevented by the installation of flexible hose connections. The gas pump was firmly fastened at the bottom.

Holes were cut across the bottom of the fuselage at the bulkhead back of the engine to prevent the collection of gasoline and oil in the fuselage.

Considering the fire hazard eliminated and that the aeroplane is flown only by good pilots familiar with its flying qualities, the JL-6 should be considered as an extremely important development, being very economical and efficient, having a remarkable performance and presenting features of construction having valuable possibilities.

J. A. MACREADY, First Lieut., A.S., Test Pilot.
HAROLD R. HARRIS, First Lieut., A.S., Test Pilot.

# TRADE NOTES.

## Concerning Hacksaws.

The hacksaw is a tool which is indispensable wherever metal of any kind is to be worked, and which has been found useful for quite a number of purposes other than that for which it is intended. In aircraft work the hacksaw is particularly widely used—and abused—and therefore the new list which has just been issued by Thos. Firth and Sons, Ltd., dealing with their "Die-Hard" hacksaws should be in the hands of all aircraft engineers. Although Firths have for some long time manufactured steel for hacksaw blades, the manufacture of the blades themselves is a new departure.

The "Die-Hard" saws are made from a special tungsten steel, of all lengths, in various widths and thicknesses, and of a range of tooth pitch from 14 to 32 teeth per inch.

The catalogue, which has just been issued, gives full particulars of these blades, their prices, and a set of useful hints to users. It is excellently produced, handy in size, complete, yet free from unnecessary matter.

Firths, Ltd., issue their catalogues in a standard series, each dealing solely with one branch of their many products, of standard size, and all in a uniform cover of buff and red. Readers of THE AEROPLANE who deal in any of the firm's products will find this series admirably arranged and convenient for reference.

## A Change of Address.

For very many years 67, Queen Victoria Street, E.C., has been the unfailing resort of the wise in search of electrical goods of all kinds. To almost any inquiry as to where one might acquire electrical appliances or fittings, "Try the General Electric Co. in Queen Victoria Street" has been a safe reply for over twenty years to the writer's knowledge.

The General Electric Company now notify that, on and after Monday, April 4th, their Head Offices, Sales Department and Stores will remove from Queen Victoria Street to their new premises, Magnet House, Kingsway, W.C.2. Magnet House will be found on the western side of the street, between Keeley Street and Kemble Street, towards the Aldwych end of Kingsway. The telephone number is Regent 7050, and the telegraphic address, "Electricity, Westcent."

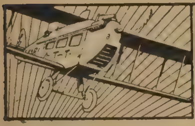
Until further notice the Showrooms will remain at the former address, 67, Queen Victoria Street.

## Strands and Cords.

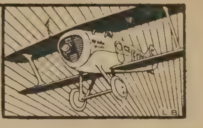
It is of considerable interest to note that Bullivant and Co., Ltd., makers of steel cords and strands, were responsible for about 60 per cent. of the supplies of these indispensable adjuncts to aircraft during the last war.

At the moment they are doing very little aircraft work, but when the boom comes they will be ready once more to supply in quantity.

The extremely few cases of breakage of cords or strands that have occurred up to now are sufficient testimony of the excellence of the work of this firm.



# COMMERCIAL AERONAUTICS AND CIVIL AERIAL TRANSPORT.



## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### OFFICIAL NOTICES.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M): next the number of passengers: and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A—Messageries Aeriennes; I.A.L.—Instone Air Line; S.F.S.—Surrey Flying Services; G.E.A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie, M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

#### MARCH 28th:

NIL.

#### MARCH 29th:

I.A.L., DH18, G-EARO, London-Paris, 08.35-11.00, G., Nil, Powell.
M.A., Breguet, F-CMAH, London-Paris, 12.50-15.35, G., Nil, Le Men.
S.N.E.T.A., DH4, O-BATO, London-Brussels, 12.55-14.25, M., Nil, Van Opstal.
S.N.E.T.A, DH4, O-BATO, Brussels-London, 11.15 (28th) 09.30, G., Nil, Van Opstal.
S.N.E.T.A., DH9, O-BIEN, Brussels-London, 11.15 (28th) 14.35, G., Nil, Salinovsky.
G.E.A., "Goliath," F-GEAD, Paris-London, 11.48 (28th) 12.32, G., 10, Patin & 1.
M.A., Breguet, F-CMAG, Paris-London, 12.10-14.55, Nil, 3, Briere.
M.A., Breguet, F-CMAB, Paris-London, 12.11-13.55 (30th), Nil, 3, Challoux
I.A.L., DH18, G-EARO, Paris-London, 12.12-14.37, Nil, 7, Powell.
M.A., Breguet, F-CMAI, Paris-London, 12.13-14.53, G.&M., 3, Malfanti.

#### MARCH 30th:

G.E.A., "Goliath," F-GEAD, London-Paris, 12.30-15.15, G., 3, Patin & 1.
M.A., Breguet, F-CMAI, London-Paris, 12.45-15.10, G., Nil, Malfanti.
M.A. Breguet, F-CMAG, London-Paris, 12.45-15.25, Nil, Nil, Briere.
S.N.E.T.A., DH9, O-BIEN, London-Brussels, 13.06-15.13, M., Nil, Sahnovsky.
I.A.L., DH18, G-EARO, London-Paris, 13.10-15.30, G.&M., 6, Powell
G.E.A., "Goliath," F-FHMU, Paris-London, 11.45-14.46, G., 10, Labouchere & 1
M.A., Salmson, F-CMAE, Paris-London, 11.57-16.45, G.&M., Nil, Charpentier.

#### MARCH 31st.

G.E.A., "Goliath," F FHMU, London-Paris, 12.45-15.00, G., 4, Labouchere & 1.
M.A., Breguet, F-CMAB, London-Paris, 13.00—, G., 1, Challoux.
M A., Salmson, F-CMAE, London-Paris, 13.01-15.24, G., Nil, Charpentier.
I A.L., DH18, G-EARO, Paris-London, 11.20-13.58, Nil, 8, Powell.
M.A., Spad, F-CMAY, Paris-London, 11.50-14.14, G., Nil, Le Sec.
M.A., Breguet, F-CMAG, Paris-London, 11.56-15.05, G., 3, Rauge.
S.N.E.T.A., DH9, O-BELG, Brussels-London, 12.15-15 05, G.&M., Nil, Van Opstal.
M.A., Breguet, F-CMAF, Paris-London, 14.17-16.26, Nil, 3, Le Men.

#### APRIL 1st:

M.A., Breguet, F-CMAF, London-Paris, 12.45-15.35, Nil, 2, Le Men.
M.A., Breguet, F-CMAG, London-Paris, 12.45-15.45, Nil, 3, Rauge.
S.N.E.T.A., DH9, O-BELG, London-Brussels, 12.57-15.30, G.&M., 1, Van Opstal.
M.A., Spad, F-CMAY, London-Paris, 12.50-15.01, G., Nil, Le Sec.
I.A.L., DH18, G-EARO, London-Paris, 12.52-15.25, G.&M., 6, Chattaway.
G.E.A., "Goliath," F-GEAD, Paris-London, 11.47-14.45, G.&M., 8, Favreau & 1.
S.N.E.T.A., DH4, O-BATO, Brussels-London, —16.10, G.&M., Nil, Delzenne.

#### APRIL 2nd:

G.E.A., "Goliath," F-GEAD, London-Paris, 12.54-16.15, G., 8, Favreau & 1.
S.N.E.T.A., DH4, O-BATO, London-Brussels, 12.55-15.40, G.&M., 2, Delzenne.
Private, Bristol, G-EAWB, London-Paris, 13.02-15.45, Nil, Nil, Butler.
M.A., Spad, F-CMAY, London-Paris, 14.25-16.50, Nil, 1, Malfanti.
S.N.E.T.A., DH9, O-BELG, Brussels-London, 10.45-13.00, G.&M., Nil, Van Opstal.
I.A.L., DH18, G-EARO, Paris-London, 10.55-13.18, Nil, 8, Chattaway.
M.A., Spad, F-CMAY, Paris-London, 11.40-13.56, Nil, 2, Malfanti.
M.A., Breguet, F-CMAG, Paris-London, 11.45-14.15, Nil, 3, Rauge.
M.A., Breguet, F-CMAC, Paris-London, 11.49-14.15, G.&M., 2, Charpentier
M.A., Salmson, F-CMAN, Paris-London, 11.50-14.26, G., Nil, Briere.

#### APRIL 3rd:

NIL.

### The Air Port of Cricklewood.

#### MARCH 28th:

H.P.T., O/400, G-EATM, Paris-London, 11.25-15.00, G.&M., 6, —

#### MARCH 29th:

H.P.T., O/400, G-EATM, London-Paris, 12.18-16.10, G.&M., 9, —

#### MARCH 30th:

H.P.T., O/400, G-EATM, Paris-London, 11.44-15.35, G.&M., 9, —

#### MARCH 31st:

H.P.T., O/400, G-EATM, London-Paris, 12.28-15.10, G.&M., 5, —

#### APRIL 1st:

H.P.T., O/400, G-EATM, Paris-London, 11.30-14.30, G.&M., 3, —

#### APRIL 2nd:

H.P.T., O/400, G-EATM, London-Paris, 12.00-15.15, G.&M., 10, —

### Air Port Statistics.

Machines, 48; Passengers, 152; Crew, 60; Total Personnel, 212

### Inland Flying at Croydon.

March 28th.—I.A.L, DH18 test (Powell); L.A.S., Avro joy-rides and to Leatherhead (Hayns), S.F.S., Avro, joy-rides (Muir).

March 29th.—L.A.S., DH6, to Leatherhead (Knowles); Private Bristol from Bristol (Butler).

March 30th.—M.W.T.C., test DH6 (Lovell); S.F.S., Avro, joy-rides (Muir); Private, Bristol 2 tests (Butler).

March 31st.—I.A.L., DH18, test (Chattaway); S.F.S., Avro, joy-rides (Muir).

April 1st.—I.A.L., "Vimy," test (Barnard); S.F.S., Avro, joy-rides (Muir).

April 2nd.—L.A.S., DH6 and Avro from Leatherhead return and joy-riding (Hayns and Knowles); S.F.S., Avro, joy-rides (Muir); I.A.L., "Vimy," test (Barnard).

April 3rd.—L.A.S., DH6, and Avro from Leatherhead return and joy-rides (Hayns and Knowles); S.F.S., Avro, joy-rides (Muir).

### The London Terminal Aerodrome.

During last week, Croydon completed its first year as the London Terminal Aerodrome. Times have fluctuated and the hope that it would turn itself into a little self-contained community of its own, which faded into the background with the death of A.T. & T., may yet be realised now that the Instone Air Line are blossoming forth.

The chief event of the week was the arrival of Mr. A. S. Butler from Bristol on a Bristol "Tourer" with a Siddeley "Puma" engine. Mr. Butler was lately in the Grenadier Guards and has bought the machine for his own personal use. He learned to fly at Hounslow at the Avro School, after the armistice. His chauffeur, who is an ex-sergeant of the R.A.F., looks after the machine.

Mr. Butler left Croydon on the machine at 13.00 hours on Saturday bound for Cannes. He arrived at Le Bourget at 15.45. He expects to get back in about six weeks' time.

Mr. Basil Foster is now personally directing at Croydon the destinies of the firm founded by him for supplying petrol and oil and running the car services in connection with the air lines. As he is now also acting with Mr. du Maurier in "Bull Dog Drummond" in the evenings, it would seem that he has his hands fairly full.

On Saturday Mr. Shaw, now a test pilot for the Aircraft Disposal Company, was acting as the "S" in Basil S. Foster, Ltd., and understudying the name part.

M. Bouderie, wrongly anticipating the result of the boat race, changed the colour of the Grands Express Aeriens hut from light to dark blue.

Mr. Blackburn, another A.D.C. test pilot, recently landed a S.N.E.T.A. machine in France in such a way that it will need a "piccolo riparazzione."

Handley Page Transport have not yet arrived from Cricklewood.

#### THE INSTONE AIR LINE.

The "Vimy" has been in with engine trouble during the week, only appearing for a few test flights.

The D.H.18 "City of Cardiff" has been over to Paris three times during the week, twice with Mr. Powell and once with Mr. Chattaway. On Tuesday she did the double journey in the day. She has been full up with passengers and goods for every trip.

The D.H.18 "City of Paris" should be out early this week and the new one from the de Havilland Aircraft Company's works should be ready almost any day. The machine is to be fitted with a handle starter.

Mr. Hall is representing D. Napier and Sons at Croydon once again.

#### The Surrey Flying Services

Mr. Muir has been taking passengers almost daily on his Avro, and on Sunday he had a long queue waiting to go up. The engine cowling has been painted red and the machine looks very smart.

Mr. Muir, who is by way of being astronomer, intends to watch the eclipse of the sun from the air on Friday.

#### The Leatherhead Aviation Co.

Mr. Chapman was kept hard at work during the week end with his Avro and D.H.6. Mr. Knowles is developing into a really star pilot on the D.H.6, the way he throws the machine about being quite extraordinary.

Mr. Hayns, who now flies the Avro, is a very capable pilot. He was an officer of the R.F.C. and passed through the Gosport course. One had the pleasure of a short flight with him on Saturday, in the course of which he committed several loops and rolls, finishing with a hair-raising side slip.

Mr. Chapman now has Mr. Fagg as his ground engineer and speaks very highly of him. Mr. Fagg was ground engineer to a joy-ride firm at Folkestone last year.—C. P.

#### The Flying Dutchman.

On Monday next, April 11th, the first Fokker machine for the K.L.M. is due to arrive at Croydon. The inauguration of the London-Amsterdam route will take place at Croydon on Thursday, April 14th. Fokker machines and de Havillands with Siddeley "Puma" engines will be used at first, and several British pilots will be employed.

### Bournemouth.

The Oxfordshire Aviation Services, under Mr. J. M. Drysdale and Mr. H. Gomez-Cornejo, commenced flying at Bournemouth on Good Friday, March 25th, and discontinued last week.

Leaving Caversham, their H.Q., at 11.00 hrs. with one passenger, Bournemouth was reached at 11.40 hrs., and after flying over Poole and Swanage a landing was made at 11.55 hrs. Passenger flying commenced in the afternoon, and although it was estimated that there were 25,000 visitors, very few flew, although the weather was exceeding good.

This can probably be attributed to the lack of publicity on the part of the Bournemouth Aviation Co., as prior to the arrival of the O.A.S. Avro, no information had been given either to the local Press or to the Entertainments Committee. However, a decorated car paraded the main streets and promenade daily throughout the holidays as an advertisement for the passenger flying, and stunting exhibitions were given over the sea, so that since the arrival of the O.A.S. there can be no excuse for anyone pleading ignorance to the existence of the ubiquitous Avro.

### Castleford.

The Berks Aviation Co. visited Castleford on March 7th for ten days, and were kept busy throughout their stay.

On one Sunday alone 70 passengers were carried in a heavy wind and driving rain between 14.00 and 17.30.

Mr. A. L. Robinson gave a fine exhibition of stunt flying, and Messrs. J. D. V. Holmes and J. C. C. Taylor "walked the wings," and were greatly applauded on landing.

### Newark-on-Trent.

The Berks. Co. commenced a flying fortnight at Newark on March 18th. Very little passenger flying was done, as the high winds rather upset the public's idea of the safety of flying, despite the fact that the Avro was in the air every day.

On Easter Monday the wind was so strong that the machine flew backwards for some distance in relation to the ground.

### Stag Lane.

The De Havilland Aircraft Company are now doing a considerable amount of flying at their Stag Lane Aerodrome. Messrs. Ortweiler and Hackett continuously fly D.H.9s from there on photographic work for Aerofilms, Ltd.

The D.H.18 for the Instone Air Line will be on test almost immediately, and the monoplane is expected to be out in May.

## THE BRITISH DOMINIONS BEYOND THE SEAS.

### AUSTRALIA.

#### Air Council Secretary.

According to *Sea, Land and Air* for February 1st, Major P. E. Coleman, O.B.E., has been selected out of 101 applicants for the position as Secretary of the Air Council and Air Board.

Major Coleman had over six years' service in the Australian Imperial Forces. At the outbreak of War, he enlisted and embarked with the 1st Division, and after service in Egypt and Gallipoli went to France. Major Coleman, who is a permanent officer of the Commonwealth Public Service, has had considerable administrative experience both in Australia and abroad.

Three new officers are shortly to be appointed to the Civil Aviation Staff, a Superintendent of Civil Flying Operations, a Superintendent of Aircraft and a Superintendent of Aerodromes.

The first set of regulations governing civil aviation in Australia will be promulgated shortly. Lieut.-Col. Brinsmead, Director of Civil Aviation, is now engaged in drafting these regulations, and it is understood that they will be modelled on the lines of the Regulations laid down in this country.

#### A Flying-boat Service.

Under the name Flying Boats, Ltd., a company has been formed in Melbourne to establish a daily flying-boat service between Melbourne and Birnie. It is proposed to start the service with two Gosport G.5 flying boats (2 360-h.p. Rolls-Royce "Eagle").

#### An Avro Triplane for Queensland.

An Avro triplane (160-h.p. Beardmore) has arrived in Sydney, consigned to the Australian Aeroplane and Engineering Co., Ltd., who have imported it to the order of the Northern Territory Air Service Co., Ltd.

After assembly and test in Sydney, it will be handed over to the above company, who will immediately begin a passenger and mail service in Northern Queensland.

### CANADA.

#### A Prohibition of "Stunting."

The Chairman of the Air Board having reported that accidents have occurred in civil flying owing to the pilot having "stunted" his machine with passengers on board, and the Technical Officers of the Board having stated that "stunting" is unnecessary in civil aviation, and that they consider its prohibition desirable, the Governor-General-in-Council amended on Dec. 4th, 1920, the Air Regulations, 1920, in the following manner:—

(a) No pilot of any flying machine shall unless he is alone therein permit or cause such flying machine to spin, roll, loop or execute any other evolution involving unnecessary risk.

(b) It shall be a defence to any prosecution under section 4, sub-section 2, of the Air Board Act for a breach of the foregoing regulation if the pilot establishes that the dangerous evolution was performed without intention on his part and notwithstanding the exercise by him of reasonable care.

### PALESTINE.

#### Palestine-Baghdad Air Service.

It has been reported that it has been decided to establish a regular air service between Ramleh and Baghdad.

An R.A.F. surveying party left Cairo in the last week in March to survey the desert route, which was first traversed by the late Lieut. Macintosh, A.F.C., and Lieut. Parer, A.F.C., on a D.H.9, in February, 1920, and to select aerodromes and landing places. The R.A.F. will provide for the upkeep of the sites chosen and also for the subsequent service.

## FOREIGN INTELLIGENCE.

### ARGENTINA.

#### Business Opportunities.

What a little courage and foresight will do is evidenced by the Curtiss mission under Leon having sold well over 20 machines at prices between £1,400 and £1,800, owing to the Curtiss firm having sent to the Argentine four machines and capital for aerodrome and hangars. The machines Leon has are J.N.4s and "Standards," with 90-h.p. and 150-h.p. Curtiss engines, and one "Oriole" (150-h.p. Curtiss K.6).

The post-war Curtiss engines have performed well, there having been no cases of engine failure, and only two accidents without serious consequences, amongst his purchasers.

It seems a pity that no British firm has had the pluck to send out an up-to-date, well-equipped mission to Buenos Aires, as one could feel sure in saying that the superiority of British post-war machines would have vouchsafed as many orders as those obtained by the famous Curtiss firm But it is essential that suitable machines be sent, as the Argentinos are not keen on buying out-of-date converted war machines for private purposes, although some types of these machines may be suitable for training or military purposes.

If any British firm is anxious to bring its latest wares to the notice of those who matter in the Argentine, they are strongly advised to send their latest catalogues and booklets giving all particulars, to the River Plate Aviation Co., Lavalle 341, Buenos Aires, who are one of the most progressive firms in South America, and also one composed of ex-R.A.F. officers, and, naturally, one primarily interested in British aircraft.

### Disposal Co. Business.

According to an authority in the Argentine the Handley Page Co. there have sold eight "disposal" Avros, and have also presented one Avro and one Bristol "Fighter" (300-h.p. Hispano-Suiza) to the Argentine Army. In addition they have sold some eight or ten machines, all of them with the exception of two Avros, being Bristol "Fighters."

It is understood that a part of the conditions of sale of the eight Avros to the Army was that they should instruct a certain number of pupils. This is being done by their pilot, Mr. Clowes, and in addition he is also instructing two private individuals on Avros.

The only long flight they have carried out was one from Buenos Aires to Santa Rosa de Toay, a distance of about 325 miles, on a Bristol, which took about four hours.

At present they have no permanent constructions, but are apparently waiting until they are more certain of future business.

## DENMARK.

### A Danish Mission to England.

The Department of Overseas Trade announce that an Advisory Committee has been appointed by the Danish Government to draw up plans for the erection of an air station at Kastrup in the Island of Amager, near Copenhagen. The station is to include an aerodrome, an airship base, and a seaplane harbour. The following are the members of the Committee: Mr. Knud Gregersen, of the Ministry of Traffic; Mr. Sven Svendsen, a Member of the Rigsdag; Lieut.-Col. Kock, commanding the Danish Military Flying Corps; Commander Grandjean, commanding the Danish Naval Flying Corps; Messrs. Helwig and Jensen, two Government engineers.

The Committee will visit England and France in the course of the next few weeks in order to study aerodrome organisation in the two countries.

At the conclusion of their labours and the presentation of the necessary report to the Government it is thought that it will be possible to begin the construction of the aerodrome and seaplane harbour in the spring of 1922 and the airship base in 1925.

## ECUADOR.

### An Italian Aeronautical Mission.

An Italian Aeronautical Mission is visiting Ecuador with the object of introducing into the market Italian Aircraft. From reports received, it is stated that a contract has been secured for the establishment, by an Italian concern, of the only available ground near the capital, and the eventual construction of a Flying School for both military and civil purposes.

Lieuts. Ellice and Guicciardi, on two Salmson biplanes, gave a flying display before the Minister of War. A cross-country flight was made from Quito to Ciencia, a distance of 250 miles, in 1 hr 40 min., at an altitude of 6,500 metres.

This mission, it is reported, has been very successful in securing contracts for the various Italian firms it represents, and an agency has been opened by them, known as the Ca. Ecuatoriana de Aviacon y Transportes.—H. G.-C.

## FRANCE.

### A Civil Reserve and Training.

Arrangements have been made by the Government for the training of civil reserve pilots under regulations drafted by the S.N.Ae. Machines are supplied by the State as are the aerodromes and hangars in cases where none belonging to Pilot's Associations or Aero Clubs are available. Each school is run by concessionaires who undertake responsibility for all aircraft lent by the Government—even in regard to damage caused in accidents by pupils. In return the concessionaire receives a grant based on hours flown and arranged to cover such charges as fuel, maintenance, writing-off machines, etc. In cases where the profit exceeds a stated proportion of the grant, the excess sum must be allocated to improvement of the various centres.

The machines to be used are Caudron G3 (Le Rhone engines) biplanes, one of which, at each station, will have dual control.

Civil pilots liable for mobilisation may make free of charge one hour of flight a month at any of the centres in being.

Trick flying is forbidden.

Five centres are to be opened this spring at Orby (Seine et Oise), Angers, Orleans, Clermont-Ferrand, and Bordeaux.

### The Paris Aero Show.

It was announced on March 25th that the Aeronautical Constructors' Association has definitely decided to hold, during November next, an International Exhibition of Aerial Locomotion, to be held in the Grand Palais as heretofore.

### A Surplus Aircraft Disposal Company.

The Société Commerciale des Stocks de l'Aviation formed recently to dispose of surplus aircraft material accumulated in consequence of war contracts has now begun work in seven separate camps. These are Mortemets, near Versailles, Blanc-Mesnil, Esquenoy (Oise), Marigny-le-Chatel (Aube), Equennes (Somme), and Voves (Eure et Loire).

## THE ROYAL AERONAUTICAL SOCIETY.

### WEEKLY NOTICES.

*Wilbur Wright Lecture.*—The annual lecture in memory of the late Wilbur Wright will be delivered by Major G. I. Taylor at the Royal Society of Arts, John Street, Adelphi, on Tuesday evening, April 12th, at 8.0 p.m. The subject will be "Scientific Methods in Aeronautics."

*Annual General Meeting.*—The Annual General Meeting was held on March 31st, when the Council's amendments to the Rules were adopted. The new Rules for the admission of Fellows and Associate Fellows, including the regulations for Associate Fellowship examinations, were also passed, and steps are being taken immediately to put these into force.

The following Members were elected to serve on the Council for the years 1921-1922:—Dr. E. Bairstow, C.B.E., F.R.S., Wing Cmdr. T. R. Cave-Browne-Cave, C.B.E., Sir Robert Hadfield, Bart. F.R.S., Capt. G. de Havilland, O.B.E., A.F.C., Lt.-Col. J. T. C. Moore-Brabazon, Lt.-Col. A. Ogilvie, C.B.E., Lt.-Col. M. O'Gorman, C.B., Col. The Master of Sempill, Major R. V. Southwell, Lt.-Col. H. T. Tizard, A.F.C.

*Safety and Economy Committee.*—The next meeting of the Safety and Economy Committee will take place at 2.30 p.m., on Friday, April 8th.

*Aeronautical Journal.*—The April issue of the *Aeronautical Journal* is now published and available to non-members at 2s. 6d. per copy. It contains Lord Montagu of Beaulieu's paper on "The Cost of Air Ton-Miles Compared with Other Forms of Transport," and a paper on "Aircraft versus Submarine," read before the Scottish Branch by Colonel L. H. Strain.

*Donation.*—The Council desire gratefully to acknowledge the gift of "Telegraphy, Aeronautics and War," by Sir Charles Bright, the author.

Royal Aeronautical Society, W. LOCKWOOD MARSH,
7, Albemarle Street, W.1, April 1st, 1921. Secretary.

## THE ROYAL AERO CLUB.

### ANNUAL GENERAL MEETING.

The Annual General Meeting of the Members of the Royal Aero Club was held at 3, Clifford Street, London, W.1, on Wednesday, March 30th, 1921, at 6 p.m. Brig-Gen. Sir Capel Holden, K.C.B., F.R.S., Vice-Chairman of the Club, occupied the Chair and stated that the Chairman of the Club, the Duke of Atholl, wished him to apologise for his absence from the Meeting on account of his being abroad.

The Chairman, in reviewing the work of the Club, stated that it was proposed to hold a number of sporting events this summer. The Club had voted £1,000 towards the expenses of the Aircraft Manufacturers competing in the Schneider Cup, to be held at Venice in July. The Aerial Derby would be held at Hendon on July 16th, 1921, and there was every prospect of an Oxford and Cambridge Race. Arrangements were also being made to hold a Seaplane Race at Cowes during the Cowes Yachting Week.

Efforts had recently been made to augment the Racing Fund, towards which the Club had voted £2,000, and a contribution of £200 had been received from Lord Cowdray. It was hoped that other public-spirited donors would come forwards and assist.

The Flying Services Fund Committee, under the Chairmanship of H.R.H. the Duke of York, had during the year distributed £5,500 in grants and allowances. This had entailed a large amount of work on the Committee responsible for its administration. It should be pointed out that the whole of the expenses of administering this Fund were borne by the Club, so that all subscriptions received were used for the benefit of those Officers and men of the Royal Air Force incapacitated, and the dependents of those who had been killed. At the end of the year the balance in hand was £8,264.

*Ballot for Committee.*—As the result of the Ballot, the following Members were elected to fill the nine vacancies on the Committee:—Lieut.-Col. John D. Dunville; Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.; Lieut.-Col. F. K. McClean; Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F.; Viscount Northcliffe; Lieut.-Col. Alec Ogilvie; Rear-Admiral Sir Godfrey M. Paine, K.C.B., M.V.O.; F. Handley Page; T. O. M. Sopwith.

*Alteration to Club Rule 42.*—On the motion of the Chairman, seconded by Sir Mortimer Singer, Club Rule 42 was altered to read as follows:—"Any Ordinary Member may, with the approval of the Committee, either upon his election or at any time thereafter, compound by one payment for all his future subscriptions, and shall thereupon become a Life Member and be entitled to all privileges of membership for life, unless he shall cease to be a Member under the provisions of Rule 58, or be suspended, required to resign, or expelled under Rule 59. The compounding fee shall be seventy guineas, which fee shall, in the case of a Member becoming a Life Member on his election, include the subscription payable on election."

*Election of President.*—On the motion of the Chairman, seconded by Col. F. Lindsay-Lloyd, C.M.G., C.B.E., the Duke of Atholl was unanimously elected President of the Club.

*Election of Vice-President.*—On the motion of the Chairman, seconded by Lieut.-Col. F. K. McClean, the Viscount Northcliffe was unanimously re-elected Vice-President.

*Election of Council.*—On the motion of Major H. A. Geaussent, seconded by Mr. E. D. Girardot, the Council for the ensuing year was unanimously elected as follows:—S.A.I. Prince Roland Bonaparte (President, F.A.I.), the Earl of Hardwicke, the Earl of Lonsdale, the Rt Hon. Lord Hugh Cecil, M.P., the Lord Howard de Walden, the Lord Kinnaird, K.T., F.R.G.S., D.L., J.P., the Lord Montagu of Beaulieu, C.S.I., Admiral of the Fleet the Rt. Hon. Sir Edward Seymour, O.M., G.C.B., G.C.V.O., Admiral of the Fleet the Earl Beatty, O.M., G.C.B., G.C.V.O., D.S.O., Admiral the Hon. Sir Edmund Fremantle, G.C.B., C.M.G., Count Henry de la Vaulx (Vice-President Aero Club de France), Sir David Salomons, Bart., the Rt. Rev. Bishop Welldon, Martin

Dale, Andre Michelin, Sir Basil Zaharoff, G.B.E., G.C.B., Air-Marshal Sir Hugh M. Trenchard, Bart., K.C.B., D.S.O.

*Presentation of Medals to Sir Ross and Sir Keith Smith.*—The Chairman presented Gold Medals to Sir Ross and Sir Keith Smith and Bronze Medals to Serjt. J. M. Bennett and Serjt. W. H. Shiers in recognition of their flight from England to Australia on November 12th to December 10th, 1919. Sir Ross Smith, responding on behalf of his brother and the two mechanics, thanked the Club for the honour conferred upon them and also for the assistance rendered to them by the Club in connection with the flight.

A vote of thanks to the Chairman concluded the Meeting

### SCHNEIDER CUP.

The Race will be held at Venice during July 29th, 30th, and 31st, 1921. Entries close on May 15th, 1921.

The Royal Aero Club has voted £1,000 towards the expenses of the three competitors selected to represent Great Britain.

All inquiries should be addressed to the Secretary, Royal Aero Club, 3, Clifford Street, London, W.1.

### ROYAL AERO CLUB RACING FUND

The following contributions have been received by the Duke of Atholl, President of the Club:—Lord Cowdray, £200; Lord Dewar, £100.

### FLYING SERVICES FUND.

*Subscriptions.*—Total subscriptions received to March 21st, 1921, £17,207 3s. 1d.; Squadron-Leader P. Litherland Teed, R.A.F. (tenth contribution), £8; Total, April 4th, 1921, £17,215 3s. 1d.

## R.A.F. APPOINTMENTS. (FROM "THE LONDON GAZETTE.")

AIR MINISTRY, Feb. 22nd.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—Flying Officer J. H. Amers is granted a permanent commn. (from Stores Branch) as a director of Music and Flying Officer, retaining his present seniority, Nov. 20th, 1920.

The following are restored to the active list:—Flt. Lt. K. M. St. C. G. Leask, M.C., Flying Officer J. H. Jephson, Feb. 8th.

STORES BRANCH.—Flying Officer J. H. Amers is granted a permanent commn., retaining his present seniority, July 22nd, 1920.

SHORT SERVICE COMMISSIONS.—The following are granted short service commns. as Flying Officers, retaining their original seniority, in the substantive rank last held prior to the grant of these commns.:—C. W. Usher, Feb. 8th; F. J. Islip, Feb. 8th.

The names of Flying Officer James Leonard Neville Bennett-Baggs are as now described, and not as stated in *Gazette* of Sept. 16th, 1919.

RE-SECONDING.—Flt. Lt. J. S. Holloway (Capt., Dorset R.), is re-seconded to the R.A.F. for a further period of two years, Aug. 1st, 1919 (substituted for the notification in *Gazette* of April 27th, 1920).

ADMINISTRATIVE BRANCH.—Pilot Officer P. G. Whittle to be Flying Officer, Jan. 21st.

TECHNICAL BRANCH.—Pilot Officer F. W. Taylor to be Flying Officer, Oct. 1st, 1919.

AIR MINISTRY, Feb. 25th.

ROYAL AIR FORCE.—Air Marshal Sir H. M. Trenchard, Bart., K.C.B, D.S.O., is appointed Principal Air Aide-de-Camp to the King, Feb. 22nd.

PERMANENT COMMISSIONS.—STORES BRANCH.—Flying Officer J. Baxter is placed on retired list, Feb. 26th.

AIR MINISTRY, March 1st.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—The following are granted permanent commns. with effect from the dates indicated, retaining their present rank and seny., except where otherwise stated. The notifications in the *Gazettes* of the dates indicated, appointing these officers to short service commissions, are cancelled:—

Flt. Lt.—D. Stewart, M.C., A.F.C., Oct 24th, 1919 (since promoted).

Flying Officers.—H. N. Hampton, D.F.C., Oct. 24th, 1919; L. N. Hollinghurst, D.F.C., Dec. 12th, 1919; R. W. G. West, Sept. 16th, 1919.

Flying Officer W. E. Theak is granted a permanent commn. in the rank stated, retaining his original seniority, May 28th, 1920. The notification in the *Gazette* of June 8th, 1920, appointing this officer to a short service commn., is cancelled.

The following Flying Officers are restored to the active list from half-pay:—C. L. King, March 4th; W. M. Yool, Feb. 15th.

Flying Officer E. E. Turner, D.F.C., is placed on half-pay, Scale B, from Feb. 5th to Feb. 10th inclusive (substituted for the notification in the *Gazette* of Feb. 18th).

Observer Officer P. C. Campbell-Martin, M.C., is dismissed the Service by sentence of General Court-Martial, Jan. 5th.

Flight Lt. R. G. Mack relinquishes his permanent commn. on account of ill-health contracted in the Service, and is permitted to retain the rank of Capt., Feb. 19th.

STORES BRANCH.—Flying Officer L. H. Vernon is granted a permanent commn., retaining his present rank and seniority, June 17th, 1920.

Flying Officer F. J. Cooke is granted a permanent commn., retaining his present rank and seniority, June 17th, 1920. The notification in the *Gazette* of Jan. 28th, appointing this officer to a short service commn., is cancelled.

Flying Officer J. Baxter is placed on the retired list, Feb. 26th.

SHORT SERVICE COMMISSIONS.—The following are granted short service commns. with effect from the dates indicated, retaining their present rank and seniority:—

Flying Officers.—S. E. Adams, Feb. 1st (substituted for the notification in the *Gazette* of Feb. 15th); G. R. Burge, Feb. 10th; E. A. Locke-Waters, Feb. 17th; H. D. O'Neill, A.F.C., August 1st, 1919 (for three years on the active list).

RE-SECONDING.—The notification in the *Gazette* of April 27th, 1920, re-seconding Flying Officer H. D. O'Neill, A.F.C., to the Royal Air Force for two years, is cancelled.

AIR MINISTRY, March 8th.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—The following are granted permanent commns. with effect from the dates indicated, retaining their present ranks and seniority. The notifications in the *Gazettes* of the dates indicated, appointing these officers to short service commns., are cancelled:—

Flight Lt.—G. W. Robarts, M.C., Oct. 10th, 1919 (since promoted).

Flying Officer.—J. Cottle, D.F.C., Dec. 12th, 1919.

Flying Officer L. J. Pearson resigns his permanent commn. and is permitted to retain the rank of Lt., Feb. 6th.

STORES BRANCH.—The following are granted permanent commns. in the ranks stated, with effect from June 17th, 1920, retaining their present seniority:—

Flight Lt.—E. J. Sayer, M.C.

Flying Officers.—C. B. Bevan (since promoted), J. Hobbs, E. L. Ridley.

The following are granted permanent commns. as Flying Officers, with effect from Sept. 12th, 1919, retaining their present seniority, and are transferred to the Stores Branch, with effect from June 17th, 1920. The notifications in the *Gazette* of Sept. 12th, 1919, appointing these officers to short service commns., are cancelled:—G. A. Curtis, W. C. Farley.

Flying Officer J. Freeman-Fowler is granted a permanent commn. in the rank stated, with effect from Sept. 12th, 1919, and is transferred to the Stores Branch for accountant duties, with effect from March 4th. The notification in the *Gazette* of Sept. 12th, 1919, appointing him to a short service commn., is cancelled. (The seniority of all officers granted permanent commns. in the Stores Branch for accountant duties is provisional only. The final seniority list of all such officers will be promulgated when the establishment is completed.)

SHORT SERVICE COMMISSIONS.—The following are granted short service commns. in the ranks stated, with effect from the dates indicated, retaining their original seniority in the substantive rank last held prior to the grant of this commn. except where otherwise stated:—

Flying Officers (from Flight Lts.).—D. Fitz-G. Fitz-Gibbon, D.S.C., Feb. 28th; C. B. Riddle, Feb. 22nd.

Flying Officers.—F. S. Harricks, Feb. 24th; L. H. Ridley, Feb. 25th; W. J. Walsh, Feb. 26th.

Flying Officers (from Pilot Officers).—C. E. F. Arthur, Feb. 24th; E. C. Brown, Feb. 26th; W. J. McDonough, Feb. 22nd B. Sykes, Feb. 26th; G. Thornton-Norris, Feb. 22nd.

Flying Officers Fitz-Gibbon and Riddle will be placed at the head of the list of Flying Officers and will retain seniority relative to officers who have been similarly gazetted to short service commns. in a rank lower than their previous substantive rank in accordance with their previous position on the gradation list.

AIR MINISTRY, March 15th.

ROYAL AIR FORCE.—PERMANENT COMMISSIONS.—Flight Lt. R. S. Sorley, D.S.C., is granted permanent commn. as a Flying Officer, Nov. 27th, 1919. The notification in *Gazette* of Nov. 28th, 1919, appointing this officer to a short service commission is cancelled.

Flying Officer C. B. S. Spackman, D.F.C., is granted permanent commn., retaining his present substantive rank and seniority, Oct. 24th, 1919. The notification in *Gazette* of Oct. 24th, 1919, appointing this officer to a short service commn., is cancelled.

Flight Lt. G. J. C. Maxwell, M.C., D.F.C., A.F.C., resigns his permanent commn., and granted rank of Major, Feb. 14th.

Wing Comdr. L. A. Strange, D.S.O., M.C., D.F.C., relinquishes his permanent commn. on account of ill-health contracted in Service, and is permitted to retain rank of Lt.-Col., Feb. 24th.

STORES BRANCH.—Flying Officer H. J. Barnham is granted a permanent commn., retaining his present substantive rank and seniroity, June 17th, 1920.

Pilot Officer F. D. D. Caussen is granted a permanent commn. as Flying Officer., with effect from, and with seniority of March 15th.

The following are granted permanent commns. as Flight Lts. for Accountant duties:—C. H. Moore, R. Whyte, March 5th.

MEDICAL BRANCH.—The following are granted permanent commns. as Flight Lts. retaining their present seniority (subject to acceptance of final conditions of service). The notification in *Gazette* of July 13th, appointing these officers to short service commns. is cancelled:—E. N. H. Gray, D.Ph., R. E. Bell, M.B., E. A. Lumley, M.C., M.B., D. G. Boddie, M.B., H. McW. Daniel, M.B., A. E. Barr-Simm, M.B., July 13th, 1920.

Flight Lt. D. McLaren, M.B., is granted a permanent commn., retaining his present substantive rank and seniority (subject to acceptance of final conditions of service), March 31st, 1920. The notification in *Gazette* of Sept. 14th, 1920, appointing this officer to a short service commn., is cancelled.

SHORT SERVICE COMMISSIONS.—The following are granted short service commns., with effect from the dates indicated, retaining their present substantive rank and seniority, except where otherwise stated:—

Flying Officer (from Sqdn. Ldr.).—C. D. Fuller, March 7th.

Flying Officer (from Flight Lt.).—E. H. Bryant, March 1st.

Flying Officer.—H. L. Christie, March 1st. The notification in *Gazette* of June 15th, 1920, appointing Flight Lt. B. J. W. Brady, D.S.M., to a short service commn., is cancelled.

STORES BRANCH.—The following are granted short service commns. in the ranks stated for Accountant duties:—

Flight Lt.—A. W. P. Phillips, O.B.E., March 5th.

Flying Officers.—P. Hay, M.C., G. N. Simon, J. Sullivan, W. R. Westcombe, March 5th.

## PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]

### ENGAGEMENT.

ADAMS—SHIPSTONE.—The marriage arranged between Flight Lieut. Francis Percy Adams, R.A.F., son of the late Mr. W. Clarke Adams and Mrs. Adams, of Moraston, Mytchett, Farnborough, Hants, and Sylvia Kathleen Shipstone, daughter of the late Mr. E. Shipstone and Mrs. Shipstone, of Algoa House, Private Road, Nottingham, will take place at 1 p.m. on April 22nd, at Carrington Church, Nottingham.

### MARRIAGES.

BURR—MOSLEY.—Gilbert Basil, late Lieut., 13 Sqdn., R.F.C., to Margaret Mary, youngest daughter of Aaron Mosley of Beeston, Notts, at Nottingham Cathedral, Saturday, March 26th.

HUSKINSON—DENNEHY.—On March 10th, at St. Andrew's, Ashley Place, by the Rev. E. Schomberg, assisted by the Rev. Percy Hales, D.S.O., Flight-Lieut. Patrick Huskinson, M.C., R.A.F., only son of Colonel and Mrs. Charles Huskinson, of Wath, Pateley Bridge, Yorkshire, formerly of Farndon, Notts, to Ada Mary, only daughter of the late Major and Mrs. Dennehy.

SANSOM—DODGSON.—On March 30th, at St. Mary's Church, Morte Hoe, by the father of the bride, George Samuel Sansom, B.Sc., M.C., D.F.C., of Kennel Moor, Milford, Godalming, only son of the late Samuel George Sansom and Mrs. Sansom, to Dorothy Vivien, youngest daughter of the Rev. Francis Vivian Dodgson, M.A., of Sunny Cliff, Morte Hoe, N. Devon, and granddaughter of the late General Sir David Scott Dodgson, K.C.B.

### BIRTH.

LUMLEY.—On March 10th, at R.A.F. Station, Eastchurch, Kent, the wife of Flt. Lieut. E. A. Lumley, R.A.F.M.S., of a son.

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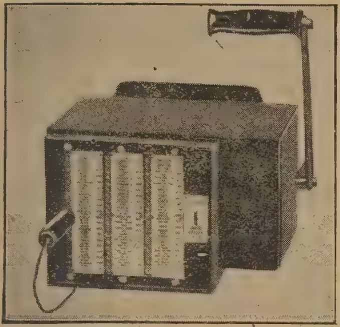

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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... ... ... ... 333
Armstrong Siddeley Motors, Ltd. ... ... 329
Arrol-Johnston, Ltd. ... ... ... *Front Cover*
Auster, Ltd. ... ... ... ... ... *Front Cover*
Automatic Telegraph Co.... ... ... ... 339
Beardmore Aero Engines, Ltd., The *Front Cover*
Bristol Aeroplane Co., Ltd. ... ... ... 323
British Thomson-Houston Co., Ltd., The ... 324
Burlington Publishing Co., Ltd., The... ... 339
Calthrop, E. R., Aerial Pat., Ltd. ... ... 333
Cellon, Ltd. ... ... ... ... ... ... 339
Cunard Line ... ... ... ... ... ... 340
De Havilland Aircraft Co., Ltd., The... ... 323
Fairey Aviation Co., Ltd., The ... ... ... 321
Hancock, James Lyne, Ltd. ... ... ... 340
Handley Page, Ltd. ... ... ... ... 324
Kodak, Ltd. ... ... ... ... ... ... 329
McGregor, Gow, & Holland, Ltd. ... ... 339
Metal Airscrew Co., Ltd.... ... ... *Front Cover*
New Pegamoid, Ltd. ... ... ... ... 340
Nieuport and General Aircraft Co., Ltd. *Back Cover*
Palmer Tyre, Ltd. ... ... ... ... ... 327
Roe, A. V., & Co., Ltd. ... ...*Inside Front Cover*
Short Bros., Ltd. ... ... ... ... *Back Cover*
Titanine, Ltd. *Front Cover & Inside Back Cover*
Westland Aircraft Works... ... ... ... 331
Wireless Press, Ltd. ... ... ... ... 333

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1921.

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# ON THE "TIMES" AND THE AIR MINISTRY.

There was a time in the history of this country when anything which appeared in the *Times* newspaper was worthy of serious consideration, no matter how much one's preconceived ideas and personal prejudices might disagree with it. To-day, one fears, that time has departed, for, in spite of extensive and painful experience of the daily Press, one cannot recall ever having seen such a devastating exhibition of transcendental imbecility as that given in the leading article published by the *Times* on April 5th under the heading "A Real Air Ministry Again."

After rejoicing that "the head of the Air Ministry is again an individual Minister, who has no other task to distract his attention" and remarking that it is not "either fair or complimentary to the new Secretary of State to lay emphasis on the fact that he is related to Mr. Winston Churchill, and to suggest that for this reason he will be the mere inheritor of his predecessor's policy at the Air Ministry," the leader-writer of the *Times* who might be supposed to possess some knowledge of history and facts as well as a modicum of intelligence says:—"Routine is the essence of War Office work; it has proved to be the bane of the Air Ministry. Military ideas have been supreme at the Air Ministry under Mr. Churchill; every favour has been shown to the military side of flying; bricks and mortar for barracks, elaborate aerodromes, high-sounding service titles—these have been, or seem to have been, the chief pre-occupation of those in control. Meanwhile actual flying has languished. Little progress has been made in the design of engines. The civil side of aviation has been systematically cold-shouldered For this the subordination of the Air Ministry to the War Office is to blame."

Continuing, this precious leader-writer says:—"With the best intentions in the world, he [Mr. Churchill in his dual capacity as War Minister and Air Minister] could have no time to spare for the proper guidance of the Air Ministry. The results have been unhappy. Gold braid and metal polish, acres of cantonments, establishments aping the Army—these are the fruits of his well-meaning and laborious, but inevitably inadequate, rule at the Air Ministry. He leaves the body of British flying well-nigh at that last gasp when a military funeral would be all that would be left for it. From its attennated frame the soul had all but departed."

## The Essence of Success.

Considered as a first-class display of combined ignorance of facts and atrophy of intellect the passages quoted attain to a high place in the annals of British journalism, a subsection of literature in which ignorance and foolishness have long been pre-eminent. Unfortunately there are those who may be seriously influenced by the aforementioned passages and therefore it seems well to present the facts as they are, so that those concerned with aviation who meet these arguments from the *Times* may be assisted in refuting them.

In the first place, routine is the essence of success in any public service and most of all in any fighting service. Law and order and discipline are the prime necessities in war when men must operate strictly together and when the failure of one may mean the failure of all whether in actual battle or on lines of communication or in the supply services at home. And law and order and discipline in war depend for their existence and maintenance on the institution of proper and intelligent routine work in time of peace. One of the chief causes of inefficiency in the R.N.A.S. and the R.F.C. and the R.A.F. during the war was the fact that everything was improvised and that there was no pre-war system of routine by which to work.

Secondly, the Air Ministry was formed during the War, against the judgment of many of our most able men, for the express purpose of making our two military flying services of the Navy and Army more effective. And the two flying services were combined into the Royal Air Force with the express intention of increasing their military power. None cried more loudly for these alterations than did the *Times* and its relatives the *Daily Mail* and the other papers of the Northcliffe Press. Yet here we have the *Times* complaining that "military ideas have been supreme at the Air Ministry."

May one ask what reason the Air Ministry would have for existing if military ideas were not supreme? If it were not for our military Air Force the Air Ministry would have no reason for being. Civil Aviation in such case would logically come under the Board of Trade as does our Mercantile Marine.

## The Needs of the Army.

The *Times* leader-writer either does not know or purposely chooses to ignore the fact that the British Army, which incidentally contributed the major part of the British Empire's effort towards helping our Allies to win the recent War, is still conducting a number of private wars in India, Mesopotamia, Palestine, Africa and Ireland, and that in all those war areas the Army is asking for more help from the Royal Air Force. Furthermore, in some areas the Army might be relieved of much work and might be decreased in size if stronger contingents of the R.A.F. were available to replace the ground troops.

The provision of these stronger overseas contingents of the R.A.F. must be therefore obviously the first consideration of the Air Ministry for that is only the continuation of the purpose for which the Air Ministry was formed during the War. If the Air Ministry failed to show every favour to the military side of flying it would be guilty of a grave dereliction of duty.

## The Needs of the Navy.

An important part of the military duties of the Air Ministry is the provision of adequate air services to the Navy. The War Staff at the Admiralty under Lord Beatty is fully alive to the importance of its air services whether for scouting or torpedoing hostile ships or bombing enemy coasts or control of gun-fire or fighting enemy aircraft. The supply and administration of these naval units of the R.A.F. is the affair of the Coastal Area R.A.F. though for operations they are under the officers commanding the Naval Units with which they serve.

The Navy is deeply concerned to-day because its air services are hopelessly inadequate. So inadequate are they in fact that it is impossible to obtain enough aviators and aeroplanes for co-operative training of Naval and Air Force units and for co-operative experiments in deck-flying, gunnery, torpedo work and so forth. A case in point will illustrate this dearth of naval aviators.

## A Sad, Sad Story.

Owing to the demobilisation of many of the best and most experienced pilots of the old R.N.A.S. and of the Navy-trained R.A.F. it is unfortunately a fact that there remain in the R.A.F. to-day only about half a dozen pilots who are at once skilful and experienced in the art and science of alighting on and flying off the decks of ships. Naturally these few are of the utmost importance to the Navy as forming the nucleus of the great forces which must sooner or later form the fighting personnel of our aircraft-carrying ships. And naturally the Navy depends on them for the experiments and consequent information which is to guide the Navy in the design and construction and operation of aircraft ships—which ships belong to the Navy and not to the R.A.F.

Only a few months ago it was necessary to send fresh R.A.F. personnel to Mesopotamia. Whether it was that they were next on the roster for foreign service or whether it was that some bright brain in the Personnel Department at the Air Ministry suddenly discovered that there are in Mesopotamia two large rivers on which gun-boats have operated one does not profess to know, but the fact remains that all these deck-fliers suddenly received orders from the Air Ministry to proceed to the Middle East.

Fortunately the Admiralty heard of these orders in time to make earnest protests to the Air Ministry and so were able to retain the services of these officers. But if they had not done so there on the spot would have been an end to all co-operative Naval and Air Force experiments in deck-flying.

Possibly this unfortunate incident might be used as an argument, and a very strong argument, against equipping the Admiralty's ships with fighting personnel and armament (for aeroplanes are only a developed substitute for guns and torpedo tubes) which belong to and are administered by a different Service and a separate Ministry. For the purposes of this present discussion one merely tells the story to indicate firstly that the military personnel and materiel of the R.A.F. are inadequate and secondly that it is very necessary for the Air Ministry to devote its chief care and consideration to the fighting forces which are in its charge.

### The Uses of Bricks and Mortar and Lace.

Seeing that the provision of adequate personnel and materiel for the R.A.F. must be the first preoccupation of the Air Ministry if it is to fulfil its purpose in the scheme of things, the utter folly of the *Times* leader-writer must be apparent to even the most limited intelligence.

Personnel to be adequate numerically and physically and technically must be adequately housed and fed and trained. Therefore they must have barracks and mess-rooms and workshops and schools and aerodromes. Hence the bricks and mortar and acres of cantonments and establishments to which the writer in question objects.

Moreover, the personnel must be adequately disciplined. Hence the high-sounding service titles and gold braid and metal polish which raise his ire. These are psychological accessories to which he has evidently failed to give due consideration. Perhaps he will appreciate them better if he will call them to mind the next time he moves smartly and obediently to the command "Pass down the car!" or "Further along the lift!" or "Passengers off first!" delivered in raucous tones by a juvenile hooligan whose sole claim to authority is the fact that he wears an "Underground" cap and has metal buttons on his jacket.

The poorest of human beings attains to a certain degree of authority and dignity when attired in a uniform and endowed with a title. The greatest of men needs a uniform and a title if he is to enforce his wishes on a number of his fellow creatures without immense waste of that nervous energy which it is desirable in the Nation's interests that he should use for higher purposes. For example would the leader-writer in question stand in any particular awe of the Editor of the *Times* if that dignitary were not entitled Editor and armed with a blue pencil?

### Direct Falsehoods.

We now come to certain absolute mis-statements of facts by this leader-writer. The truth is that actual flying has *not* languished and that much progress *has* been made in engine (and aeroplane) design

Perhaps there has been less civilian flying during the past three months than there was a year ago. One is not sure. The various small "joy-ride" concerns have been too busy during this long spell of fine weather to report their doings, so possibly they have done more. Our cross-Channel air lines expired, but that was purely because of bad management or bad finance or lack of intelligence on the part of the business community.

On the other hand Service flying, which is of the first importance, has made great progress. Flying under direction by "wireless" has reached a high pitch of efficiency. Deck-flying, despite the paucity of personnel, has advanced immensely. Amphibian flying shows huge developments. New fighting and bombing and torpedo methods have been evolved to a most impressive extent.

Thanks to the Air Ministry Competition at Martlesham in July and August last a vast amount of most valuable information has been obtained concerning the design and running costs of commercial aeroplanes. Experiments in the air with new wing forms such as the Handley Page and Alula have showed the way towards new lines of progress In fact, so far from languishing, the actual increase in knowledge concerning flying during the past year and more is most encouraging.

If the increase in the actual amount of flying done is not so great as it might have been it is entirely the fault of the British commercial community for not realising the immense value of civil aerial transport. And one of the chief causes of this lamentable ignorance and obtuseness on the part of the business community is the imbecile manner in which the daily Press, including the Northcliffe Press, has mishandled news concerning aviation. But it is not the fault of the Air Ministry.

### Lord Northcliffe.

A few weeks ago in the South of France one had a long talk with Lord Northcliffe. He is as desirous as a man can be of helping British and International aviation. He is willing to put up more of his munificent prizes if good opportunity offers. He has ordered his papers in the most emphatic manner to support aviation.

But unhappily his health prevents him from living in England and so he cannot be personally in close touch either with developments day by day or with the errors of his employees. One can only hope that very soon his health may permit him to return to this country so that he may devote some of his great ability to helping British Aviation as only he has the power to help it.

One makes this explanation because it is only fair that the aeronautical community should understand that Lord Northcliffe is no more to blame for the statements in the *Times* and others of his papers than the Air Ministry is to blame for the failure of our cross-Channel air lines last year.

### Our Progress in Aero-Engines.

As concerns the design of engines, more progress has been made in the past year in this country than anywhere in the World. In the Napier "Cub" and the Rolls-Royce "Condor" and the Siddeley "Tiger" we have the three biggest aero-engines in the World. The Napier "Lion" has come to its full efficiency and stands alone in its class. In no other country has any real progress been made in air-cooled engines, yet we can show the Bristol "Jupiter," the Armstrong-Siddeley radials, and the Royal Aircraft Establishment's improvements in the A.B.C. "Dragonfly" as proofs of progress. The excellent 160-h.p. Beardmore, beloved of war pilots, now gives 200-h.p. with ease.

All these show absolute progress over our own previous developments, and when they are compared with what has been done in other countries they set us in advance of the whole World. And yet this leader-writer in the *Times* has the impudence or the imbecility to set aside all this excellent work, largely due to the Directorate of Research, and to proclaim in a purely political attack that "little progress has been made in the design of engines." If in fact this is the result of "the subordination of the Air Ministry to the War Office," then for Heaven's sake let us abolish the Air Ministry and put all aviation under the War Office.

### Some Truths on Civil Aviation.

Finally we come to the amazing, or amusing, statement that "the civil side of aviation has been systematically cold-shouldered." Was civil aviation cold-shouldered when a whole Department and £1,000,000 was devoted to its interests? If only about half that amount has been spent on civil aviation in the past financial year it is because the commercial community had not the wits to provide more civil aviation on which to spend it. If there had been more or bigger air lines to regulate and govern more money would have been spent.

And if more money had been spent and Supplementary Estimates had been laid before Parliament for Civil Aviation the first people to scream about the expenditure would have been the "Anti-Waste" Press, as it is pleased to call itself. If in default of commercial energy the Air Ministry had started to run Government air lines to Paris and Amsterdam and Berlin and Prague and Rome and Athens and Egypt what an outcry we should have had against interference with private enterprise and the evils of State ownership and the spread of bureaucracy and the ambition of grasping officialdom and the squandering of the tax-payers' money.

To-day, thanks to the wails of the same "Anti-Waste" Press the Air Ministry has weakly allowed itself to be rushed into bolstering-up a "temporary" cross-Channel air service. As a result it has practically killed a genuine National Air Transport Company financed by real business men. And yet the *Times* proclaims that Civil Aviation has been cold-shouldered.

### Some Final Samples.

The utter foolishness of the *Times* man may be further emphasised by a few more of his later phrases :—

"The balance between military and civil aviation must be struck for it has not been struck yet." One suggests that the striking of the balance is a matter for the financiers of the commercial community and not for a Ministry primarily concerned with Imperial defence.

"No Imperial interest can compare with the need for the development of quick long-distance transport." For example it is more important to have an air-line from London to Calcutta than to have adequate protection for our Persian oil-wells, or to have adequate forces to ensure peace in those parts of Palestine and Mesopotamia and India over which that air-line must pass, is it?

"Our future greatness as a nation may depend on our imaginative foresight giving us a view of just a few more inches round the corner of the future and on the start which this prescience may ensure to us. With that in his mind Captain Guest may do wonders; but the field for doing them is on the civil, far more than on the military, side of aviation. We suggest that he should rake his military estimates for savings to apply to the development of civil aviation."

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*Constructeurs, sur commande spéciale du Gouvernement Britannique, du plus grand bateau volante construit jusqu'à ce jour.*

*Etude et entreprise de la fourniture du matériel complet pour services de transport aérien rapide de passages, courrier et marchandises. Constructeurs des Fairey Type III. Série de machines fournies en grandes quantités au Gouvernement Britannique pendant la guerre et depuis la cessation des hostilités. Dans cette série de machines, le fuselage, le plan central et la queue, etc., sont standardises, et sont construits de manière à pouvoir recevoir des ailes des types différents, ainsi que des châssis et moteurs d'autres machines de la série, de manière à être appropriés à l'usage auquel la machine est destinée dans chaque cas particulier. Toutes les machines de cette série ont des ailes démontables et repliables, et sont munies de notre dispositif breveté de cambrure variable, qui permet les plus grandes performances et qui combine une grande puissance de soulèvement avec une faible vitesse d'atterrissage.*

Diseñadores y constructores de hidroaviones, barcos aéreos, aeroplanos, aparatos anfibios, de todas clases, tambien de apartos especialmente adecuados para el levantamiento de cartas topográficas y fotografias, hangares flotantes y completo equipo para estos mismos.

Diseñadores, á pedido especial del Gobierno Británico del barco aéreo mas grande que se ha construido para este gobierno.

Proveedores de todo lo necesario para servicios de transporte aéreo de pasajeros, correos y mercancías.

Diseñadores y constructores del tipo Fairey III. Serie de aparatos suministrados en cantidad al Gobierno Británico, durante la guerra *y después de su terminación.* En esta serie de aparatos, el fuselage, el plano central y la unidad de la cola, son standard y fabricados para adaptarse á diferentes tipos de alas, chassis y motores de otros aparatos de series que sean adecuadas para ejecutar los fines particulares para los cuales se requiera el empleo del aparato. Todas las máquinas de este tipo, tienen alas plegadizas y eatán provistas del dispositivo patentado de combeo variable Fairey que da una alta performance y potencia de ascensión combinada con una velocidad baja de aterrisaje.

Was there ever worse drivel published by a newspaper of high standing? One suggests to Captain Guest that the less attention he pays to the *Times* leader-writer the better it will be for his career as Air Minister. One suggests further to him that our future greatness as a nation may depend far more on bald facts concerning enemy forces which the Flying Services may discern some few hundreds of miles away than on any imaginative foresight a few inches round any apochryphal corner.

Let him give the Research Department enough money to keep our aircraft and aero-engine and aeronautical instrument designers busy developing their new ideas and we shall have all the start any prescience can ensure. Let him keep his military estimates as high as he can and the Royal Air Force will then be able to attend adequately to our future greatness as a nation. Let him leave Civil Aviation to "conduct its own manœuvres in its own damned tinker fashion"—as Mr. Kipling said of another matter—and all in good time the English commercial man will be scared into finding the necessary finance for commercial aeronautics.

### "Nunc Dimittis."

In conclusion, so far from Mr. Churchill leaving British flying an "attenuated frame" from which "the soul had all but departed," he leaves a Royal Air Force which is the strongest, the most efficient, the best eqquipped and the most experienced in the world. He leaves a magnificent young Third Service which has just found its soul and is beginning to build up a splendid tradition of its own based on its own glorious war service and on the great traditions of the Navy and Army from which it is descended.

Surely that alone is enough to show that Mr. Churchill has well served his King and his country and to earn for him the gratitude of all British people. He goes to turn his great ability to the welfare of British Dominions over Seas and he carries with him the good wishes of all concerned with British Aeronautics. One can wish Captain Guest no better than that he may succeed in doing as much for the Royal Air Force and for British Aerial Supremacy as did that fraction of Mr. Churchill which was detailed for duty at the Air Ministry.

C. G. G.

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## STRIKE PREPARATIONS IN THE ROYAL AIR FORCE.

The Air Ministry issued on April 8th a *communiqué* asking demobilised pilots desirous of volunteering to serve in the present emergency to report in person or in writing to the Director of Personnel at the Air Ministry. As a result some hundreds of demobilised and retired officers visited the Air Ministry on Saturday and the following days. Those selected for service received clearly written memoranda as to the conditions of service and were told to report at various group headquarters for posting.

The arrangements made were excellent and indicate the greatly increased efficiency of the military branch of the Air Ministry.

Capt. Guest, the Secretary of State for Air, has asked in the House of Commons for an addition of 10,000 men to the original Estimates.

## THE TRAGEDY OF AN OVERWORKED LIGHTHOUSE.

A rather pathetic little scene took place at Croydon Aerodrome on Friday last during the eclipse of the sun. There stands in one corner of the aerodrome a lighthouse. It is rather a conscientious lighthouse and likes to do its duty in the interests of mankind as a good non-trade-unionist lighthouse should. It is of the automatic type and lights up on its own initiative as soon as the light fades.

Well, after a hard night's work on Thursday-Friday it was enjoying a well-earned sleep. Soon after 09.00 hrs. however it seemed to scent something wrong, and remarking to itself, "H'm, ha—pouf," as it always does, it lit. However, seeing that it was morning it concluded that there was a mistake somewhere and shut down, feeling a bit shaken—even as you or I.

Gradually as the moon crossed the sun the morning grew darker and the poor old lighthouse, evidently not wanting to be reprimanded by Mr. Biddlecombe—Mr. Biddlecombe is its keeper, and, I think, he is something of a martinet with lighthouses, as this one seems rather afraid of him—lit up again much against its own judgment and looked round peevishly.

As the moon receded from the sun's disc and the light grew, the lighthouse, now sure that Mr. Biddlecombe was merely pulling its leg, shut down with such a jerk that I am assured that it broke a burner.

It is not policy to tease lighthouses. Much more can be accomplished by kindness.—G. D.

## MR. HINKLER AGAIN.

Mr. Bert Hinkler, the hero of the London-Turin flight, has signalised his arrival in Australia by a flight as remarkable as that which first made him famous. On the same Baby Avro with the 35-h.p. Green engine he flew from Sydney to his home at Bundaburg, in Queensland, a distance of 800 miles, in 9 hours without a stop. A truly wonderful performance for man and machine.

## CONGRATULATIONS.

Mr. Alexander Klemin, Technical Editor of *Aviation and Aircraft Journal*—the leading technical paper of the Western Hemisphere—is to be congratulated on being one of the five designers whose designs have been accepted and are eligible for final examination by the U.S. Naval Board appointed to adjudicate on the Navy Competition for Designs for Ship Aeroplanes.

The other four chosen were by the Curtiss and the Dayton-Wright firms, by G. Elias and Bros., and by Mr. A. L. Morse of the Massachusetts Institute of Technology. There were in all thirty designs submitted. The prizes are respectively 16,000 dols., 10,000 dols., 5,000 dols. and 3,000 dols.

**ON THE LONDON-PARIS AIR ROUTE, 1921.—Subsidised Civil Aviation provides us with this specimen of British enterprise. An O/400 type Handley Page Biplane (Roll-Royce Engines) as designed in 1915 and slightly modified as to the fuselage for air transport work is here seen on its way to Paris. This machine, which was piloted by Mr. Wilcockson, was photographed from another similar antique by Captain Brewer with an Aero-Kodak Camera. Under existing circumstances, and in view of the toughness of these reverend and venerable aircraft, a similar photograph will probably be takable in 1931.**

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# NAVAL AND MILITARY AERONAUTICS.

## GREAT BRITAIN.

### Short Service Commissions in the R.A.F.

The Air Ministry announces :—

The lower age limit for candidates for short service commissions is now 18.

Full particulars can be obtained by written application to the Secretary (S.7), Air Ministry, Kingsway, W.C.2.

### The Annual Dinner of 47 Squadron, R.A.F.

The first reunion dinner of No. 47 Squadron R.F.C. and R.A.F. was held on April 2nd at the Pall Mall Restaurant, Haymarket. Col. C. C. Wigram was in the chair. There were some 26 members present, another ten who had previously accepted being prevented from attending. Those who did come had served with the Squadron either in Salonika or Russia.

It is interesting to note that 47 has been chosen as the number representing a permanent squadron, at present stationed in Egypt. It is understood that the numbers of those squadrons which distinguished themselves during the war are being maintained on account of the fine records and traditions which they bear. This has been done with the late Captain Ball's Squadron and also Major Bishop's Squadron.

The question of the publication of the Squadron History was discussed. It has been compiled by Mr. H. A. Jones, who is working at the Air Historical Branch of the Cabinet under Sir Walter Raleigh.

All those interested in the history or who would like to be kept informed of the Squadron dinners (which are to be held annually on the first Saturday in April) are asked to communicate with Captain D. F. Woodford, Selhurst Park, Chichester, who has undertaken to arrange them.

### Osborne College.

At sundown, April 8th, the White Ensign was struck for the last time at the R.N. College, Osborne, where since 1903 cadets have received their preliminary training for the Royal Navy.

It is understood that the Air Ministry are desirous of taking over the college for the training and instruction of R.A.F. officers. In addition to the college buildings there are about 40 acres of Osborne estate. By the Royal Air Force taking over the college and not building a permanent college at Cranwell a large saving would be effected, in addition to which the buildings are all ready for immediate occupation and more or less fully equipped as a training establishment.

But it could never compare with Cranwell as a training centre for young aviators, when one considers the excellence of Lincolnshire as flying country.

### An Interesting New Machine.

It is reported from the Midlands that the big twin-engined bomber on which the Siddeley-Deasy Co.—now the Armstrong-Siddeley Co.—had begun work towards the end of the war is now completed and will shortly be tested. She is fitted with two Siddeley "Tiger" engines of approximately 700-h.p. each and is known, in accordance with the Air Ministry system of nomenclature, as the "Sinaia." Mount Sinai being the highest altitude in its immediate neighbourhood the name may presumably be taken as expressing the aspirations of her designer.

The delay in the appearance of the machine is obviously due to the cessation of all new design work during 1919 and, to the slowing down of engine development during that period. The "Tiger" may, in a general way, be described as two Siddeley "Pumas" arranged in V fashion, and boosted to higher power. As the "Puma" is now regarded as one of the most reliable engines of the day there is every prospect of the "Tiger" giving excellent results.

Though the specification of the "Sinaia" is not made public one gathers that she is a big machine with a span of approximately 100 feet and that the engine nacelles are used as gun-pits as well as merely for housing the power plant. Also she carries one of the Coventry Ordnance Co.'s "cannon." Her performance will be watched with interest as she is probably the most powerful twin-engined machine in existence.

### Naval and Air Signalling Co-operation.

A Naval order states that instructions have been issued by the Air Ministry for inter-ground station visual signalling exercises to be carried out between the Services where practicable, when no machines are available for exercises between ground stations and aircraft in flight.

## MESOPOTAMIA.

### General Ironside Injured.

It has been reported from Baghdad that General Ironside, G.O.C. Forces in Mesopotamia, has been injured in an aeroplane accident.

The machine in which he was flying made a forced landing near Samawa in a duststorm, as a result of which the General sustained a fractured thigh. He was conveyed to Basra, and the latest reports give his condition as satisfactory.

# ENTRIES FOR THE MONACO MEETING.

The following gives the final list of entries for the Monaco seaplane meeting to be held from the 13th to the 20th of this month. It will be noticed that again no British firms have entered although it seems that from the results of last year one or two British machines that are in existence now could, if not win, put up an excellent show and so further their interests abroad.

(1) Monaco-Ajaccio-Monaco.—1 Nieuport, 2 Breguet 14.A2, 3 Caudron C.39, 4 Farman G.L. flying-boat, 5 Savoia S.12, 6 Savioa S.22.

(2) Monaco-Cannes-San Remo-Monaco.—1 Nieuport, 2 Breguet 14.A2, 3 Caudron C.39, 4 Caudron C.51, 5 Savoia S.12, 6 Savoia S.21, 7 Savoia S.22, 8 Farman G.L., 9 Spad.

(3) Monaco-Cannes-Monaco-Mentone-Monaco (Speed competition).—1 Spad, 2 Breguet 14.A2, 3 Farman G.L., 4 Caudron C.51, 5 Savoia S.12, 6 Savoia S.21, 7 Savoia S.22.

(4) Height Competition.—1 Spad, 2 Breguet 14.A2, 3 Farman G.L., 4 Caudron C.51, 5 Savoia S.12.

(5) Landing Competition.—1 Spad, 2 Breguet 14.A2, 3 Farman G.L., 4 Caudron C.51, 5 Savoia S.12, 6 Farman.

(6) Destruction of Balloons.—1 Spad, 2 Breguet 14.A2, 3 Farman G.L., 4 Caudron C.51, 5 Farman.

(7) Speed over measured nautical mile.—1 Spad, 2 Farman G.L., 3 Savoia S.21, 4 Savoia S.22, 5 Savoia S.12.

# A MARKET FOR BRITISH AIRCRAFT.

One is informed that the Republic of Honduras is in the market at present for ten modern two-place fighting machines and fifteen training machines. The Chief of Aviation in that country wishes to get into direct communication with British manufacturers who are prepared to negotiate the sale of such machines. It is probable that apart from these war machines there will soon be a market also for several large passenger and freight carrying machines. Letters addressed to Mr. D. Ivan Lamb, c/o THE AEROPLANE, will be forwarded to the right quarter. These letters should be marked "Y.2." in the top left-hand corner.

# TRADE UNION TROUBLES.

One of the best Trade Union stories concerns a certain aeroplane firm which soon after the war turned over to motor work. The expert coach-builders who were brought in refused to let mere aeroplane hands touch coach-work and so nearly all the aeroplane wood-workers had to be dismissed, though quite capable of doing most of the work.

When the aeroplane trade began to revive, not long ago, the firm went back to aeroplane work and wished to retain some of the more useful coach-builders But the aeroplane workers—such is the solidarity of the proletariat and brotherly love among the workers—refused in turn to let the coach-builders do aeroplane work, so out the coach-builders had to go.

Recently the manager had occasion to discuss the matter with one of the men's leaders, who explained that personally he felt no animosity, but as a matter of principle the aeroplane workers had to get a bit of their own back off the coach-builders. "But," asked the manager, "then why do you let Smithers remain here? He's a coach-builder." "Ah! He's a different case," replied the men's leader. "You see we want him for the cricket team!"

After all there is still some hope for a country when one union insists on getting its own back off another and when the union which happens to come out on top will go back on its own principles for the sake of sport.

# *AIRCRAFT IN PARLIAMENT*

## HOUSE OF COMMONS.

### THE ARMY AND AIR FORCE (ANNUAL) BILL.

The Army and Air Force (Annual) Bill was read a second time on April 4th and should have been committed to a Committee of the whole House on the following day. Owing to the present emergency the Committee stage of the Bill was postponed indefinitely.

The following written answer was given on April 7th, 1921 :—

### EASTBOURNE AERODROME.

Mr. RAPER asked the Secretary of State for Air who is now responsible for the Eastbourne aerodrome, and why the same has not been retained by the Air Ministry as a supplementary landing ground, in view of the fact that this aerodrome, besides being one of the oldest in the United Kingdom, is also in the most important geographical position from the point of view of commercial aviation; and whether the Air Ministry notice, dated April 1st, cancelling notice to airmen, No. 135, dated December 9th, 1920, indicates that this aerodrome is again fit for use?

Mr. McCURDY (Joint Parliamentary Secretary to the Treasury): I have been asked to reply. This aerodrome was licensed to the Eastbourne Aviation Company, who asked for a cancellation of the licence in December last, and have since demolished the aerodrome. It was considered, with others, from the point of view of retention by the Air Ministry, but the circumstances did not justify its selection for the purpose. The answer to the last part of the question is in the negative.

Mr. RAPER: Is it not a fact that notice was issued on April 1st cancelling No. 135?

Mr. McCURDY: I must ask for notice of that question.

## LONDON-PARIS AIR ROUTE

### British Service Restored
### DAILY FLIGHTS

Regular services on the cross-Channel route by British aircraft stopped on the last day of February. When they are resumed to-morrow the first machine will leave Cricklewood Aerodrome at noon. During the week that follows, Messrs. Handley Page and Messrs. Instone will maintain a daily service, each firm flying machines on alternate days from Croydon. Thereafter the two services will be maintained daily. The machines to be employed are Vickers-Vimys, D.H.9s and 19s, and Handley Pages. All are fitted with Rolls-Royce engines.

"*The Times,*" *March 18th*, 1921.

# "All are fitted with ROLLS ROYCE ENGINES"

"*The Times,*" *March 18th*, 1921

ROLLS-ROYCE AERO ENGINES—LIKE ROLLS-ROYCE CARS—ARE THE BEST IN THE WORLD

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"*Aircraft Engineering,*" *July*, 1920

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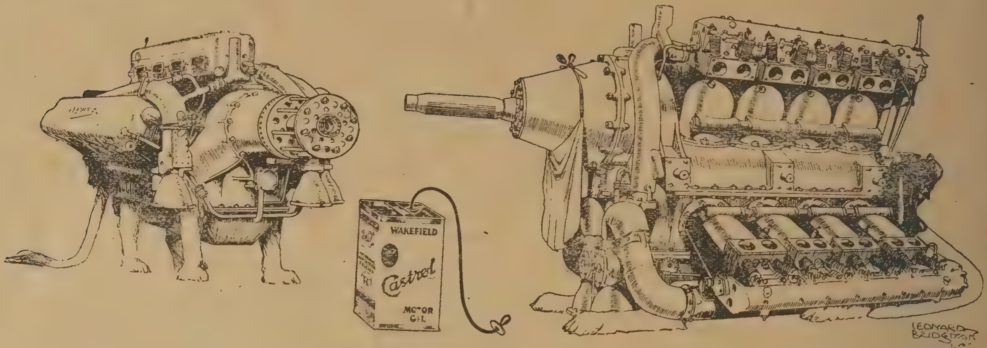

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(*The Napier "Lion."*) (*The Napier "Cub" 1000 h.p.*)

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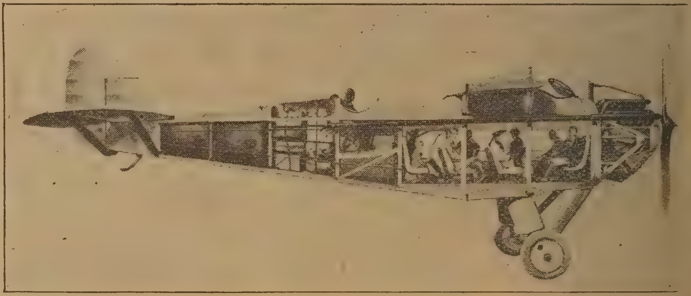
DH18



The machine which can transport 8 passengers at a gross cost of 4$^{D}$ each per mile.

***IMPORTANT:***—*By GROSS COST is meant fuel, pilot, insurance, maintenance and depreciation of machine and engine, all overhead charges, and every expense involved in running an air line.*

We have one DH 18 machine ready for immediate delivery.

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STAG LANE AERODROME, EDGWARE, MIDDLESEX.

AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

In a short article below the figures for passenger traffic on the British London-Paris service since its reopening are compared with those of one of the weeks of last summer, when it is claimed that the A.T. and T. service was making a profit. These figures do not seem to bear out the contention that the £6 6s. fare is not remunerative. They seem, on the contrary, to show that the reduced fare has led at once to an increase in the revenue earned per trip and that there was greater need for a subsidy under the old conditions than there is now.

Photographs of the first machine produced by the firm of Geo. Parnall and Co. of Bristol appear in this issue. The machine is interesting in itself, but this interest is increased by the fact that the firm which built it is one of those founded since the Armistice purely as an aircraft manufacturing concern.

In the earlier days of aviation the name of Hanriot took a leading place among those of French aircraft makers. The Hanriot concern ceased to build aeroplanes some time before the outbreak of war, but began operations at some time *circa* 1916, and continue their activities. A description of the main types produced since the firm's resurrection is given in this issue.

## DOES AIR TRAFFIC PAY?

It is not unnatural that those who have practical experience in the running of aerial transport enterprises on any large scale should keep to themselves as far as is possible all statistics as to traffic, working costs, revenue, and the like. Therefore when those who are concerned in the operation of such air lines state that under such and such conditions their operations are necessarily carried on at a loss, it is extremely difficult for the outsider to contend with them, since the matter in dispute resolves itself finally into a question of fact, and the fact is within the knowledge of one party only.

Nevertheless it is possible, by patiently delving into such records of aerial traffic as are available to attain a certain amount of information of a qualitative sort.

Taking the returns of the period of last summer, when the air traffic between London and Paris was at its height, and selecting one week, Sept. 6th to 12th inclusive, which, if not the best week, was at least a very good one, certain rather instructive facts can be extracted.

It will be remembered that at this date the now defunct A.T. and T. Ltd. claimed that their operations were being conducted at a profit. For this reason, and because at the present moment only the London-Paris serviee is in operation, for a preliminary comparison between the state of affairs last summer and the conditions now holding, the figures for the A.T. and T. Ltd. service between London and Paris alone will be extracted from last Summer's returns.

### London-Paris Passenger Traffic in September.

In the particular week in question A.T. and T. carried between London and Paris 108 passengers in a total of 41 trips. There were employed on that service during that week eight separate machines of three different types—D.H.9s, D.H.16s, and D.H.18s.

Eleven trips, accounting for 15 passengers, were made by D.H.9s, twenty-two trips, 62 passengers, were made by the D.H.16s, and eight trips, 31 passengers, were made on D.H.18s. The average number of passengers per trip over the whole service is $\frac{108}{41} = 2.64$, which at £10 10s. per head is a mean revenue from passengers of £27 14s. 5d. per machine trip. The average number of passengers per D.H.9 trip was 1.36, per D.H.16 trip was 2.8, and per D.H.18 trip was 3.86.

### Some Reasonable Conclusions Therefrom.

Although it was stated that the service was at this time making a profit, there can be little doubt that the D.H.9s were certainly making a loss, and that the profit was practically entirely due to the operation of the D.H.18s.

Therefore it seems fairly safe to conclude that aa a time when D.H.18s were carrying an average of 3.86 passengers per trip they were giving a reasonable return certainly upon the capital invested in the 18s themselves. It has to be admitted here that as the machines carried goods and mail in addition to passengers, the average number of passengers carried is not an index to the revenue earned by the machines, and it certainly does not mean that an average of 3.86 passengers per trip at £10 10s. per passenger would pay without other sources of revenue. But unfortunately the record of passengers carried is the only index of revenue earned which is available, and it is more or less an admitted fact that carrying this number of passengers the D.H.18s paid.

The revenue per passenger did not exceed £10 10s per head, and therefore under the conditions of this service a revenue from passengers alone of 3.86 × £10 10s. = £42 3s. 2d. per trip can be regarded as a healthy sign.

Now it was very definitely stated by those who should know that it was not possible to compete with the French services at a fare of £6 6s. without a countervailing British subsidy. A subsidy in some form has now been granted, and a British London-Paris service is now in operation charging the reduced fare.

### Traffic Statistics of To-day.

The statistics which are available show that on this British service between March 21st and April 4th there were run 25 trips, and that there were carried 156 passengers, an average of 6.24 passengers per trip, or at the new fare of £6 6s., an average revenue per trip of £39 6s. 2d. That is to say that with the reduction in fare there has come an average revenue per trip nearly 50 per cent. greater than that taken on an average by A.T. and T. in its best days, and only very little (7½ per cent.) less than that taken by their best paying craft at that palmy period: namely £27 14s. 5d. and £42 3s 2d. respectively

It is to be remembered that this has occurred at a time of the year scarcely calculated to encourage aerial travelling, and with a service much more restricted, less convenient, and therefore less likely to attract traffic than at the earlier period which was taken into account, and that these figures are for the first two weeks of the revived service.

### Does the £6 6s. Fare Pay?

These figures do not appear to bear out the suggestion that the £6 6s. fare is far from being a remunerative one. It seems on the contrary to show that, as experience with other forms of traffic would lead one to expect, the reduction in fares has led to such an increase of traffic as to increase the average revenue.

The increase in passenger traffic is not necessarily accompanied by an equal increase in goods traffic. But in view of the fact that a decrease in the parcels rate equivalent to that made in the fare has occurred it seems reasonable to believe that the average weight of goods carried per trip has increased in somewhat the same proportions as the number of passengers carried.

And if this is the case the average revenue now being earned per trip by the British machines on the London-Paris service is now higher than it ever was before even without taking into account the subsidies.

### Some Queries.

Now there are certain curious facts about the present £6 6s. fare. Ostensibly the French lines have been enabled to come down to this figure in view of the new French subsidies. According to the regulations, which have been published, the services now running are not eligible for these subsidies to any great extent. The subsidy for purchase only applies to machines built before July 1st, 1920, and only in part to any bought before January 1st, 1921. Of the other subsidies none are to be granted to companies which do not conform to the requirements as to a minimum stock of machines and pilots. As these requirements call for not more than 100 flying hours per annum per machine, or 300 flying hours per annum per pilot, it seems probable that very few of the French firms now operating can be qualified for the subsidies.

Are the French regulations merely eyewash and is a subsidy being granted without reference to them, or have the French come to the conclusion that it pays to reduce fares?

And further is the whole demand for subsidies in this country anything but one large bluff?

## THE AERONAUTICAL JOURNAL.

The March number of the organ of the Royal Aeronautical Society contains, in addition to the annual report of the Council for the year 1920-21, the full report of Mr. H. R. Ricardo's paper on "Some Lines of Possible Development in Aircraft Engines," of Mr. A. J. Rowledge's paper on "Engine Installation" and the discussion on both papers.

The same issue contains the conclusion of the article on the "Development of Giant Aircraft in Germany."

This article is of very considerable interest. It deals not with details of German giant aircraft, nor with specific examples, but considers the military reasons which led to the German development of large aëroplanes, the limitations imposed by their specific military uses, by the limited choice of engines, and by the shortage of materials of construction.

German giant aircraft have been divided by the author into three types, of which the first two are variants of aeroplanes of normal design, the first with multiple engines distributed along the wings, and the second with a central power plant. The third class is one which at the time of writing had not reached the "giant" stage, but which the author considers to be an effort to explore the possibilities of reaching giant sizes.

The complete article is of very great interest although one may find occasions for disagreement with the author.

It is, for instance, a little difficult to account for his treatment of the Junkers' cantilever monoplane as the prototype of a class of giant machines holding out great prospects of success when the internal evidence in the article itself indicates that no giant machine of the type existed when that article was written.

It is a tribute to his prescience that the Zeppelin company have since completed a giant machine more or less of this type which appears to have been highly successful. But as the Zeppelin giant monoplane represents merely the application to the small Junkers of exactly the same expedients as were employed to derive "giant" biplanes from normal small biplanes this fact is no very certain confirmation of his theories, which, among other things, are likely to arouse the wrath of Major A. R. Low.

**A NEW AMPHIBIAN.—The machine shown in the attached three photographs is the first product of the firm of George Parnall and Co., of Bristol. It has been built for the R.A.F. to the designs of Mr. H. Bolas, the firm's designer-in-chief, and is known as the Parnall "Puffin."**

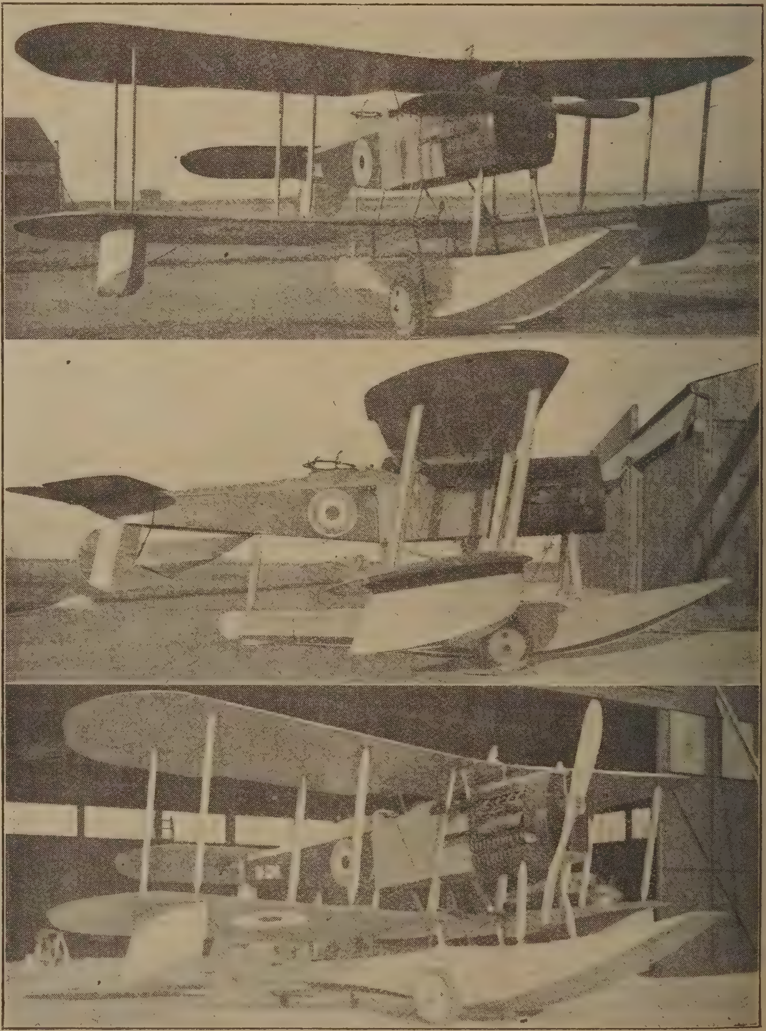
**As may here be seen from the photographs, the machine is a central-float seaplane amphibian possessing a number of curious features. The extreme length of the central float is noticeable, together with the fact that the extreme after-end thereof is apparently a separate structure supported from the fuselage by a special strut.**

**It is assumed that shock absorbing qualities are somewhere incorporated in the attachment of this tail, which must act as a tail skid when the machine is on its wheels.**

**Large wing-tip floats are fitted owing to the lateral instability of the central float arrangement, and it will be interesting to hear how this machine compares with two-float seaplanes for manœuvrability on the surface. The tail unit is also unusual, as the fin and rudder are entirely beneath the fuselage, and both these organs and the tail plane and elevators are free from any bracing—obviously with a view to a clear field of fire for the after gun.**

**The central side-view photograph shows the position of the pilot, who evidently has a clear view over the upper centre section, and also must have an excellent view downwards, as the single float can block out nothing that would not be obscured by the fuselage itself.**

**The photographs are published by special permission of the Air Ministry, but no information other than that which can be obtained from the pictures is allowed to be published.**



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*Full particulars on application.*

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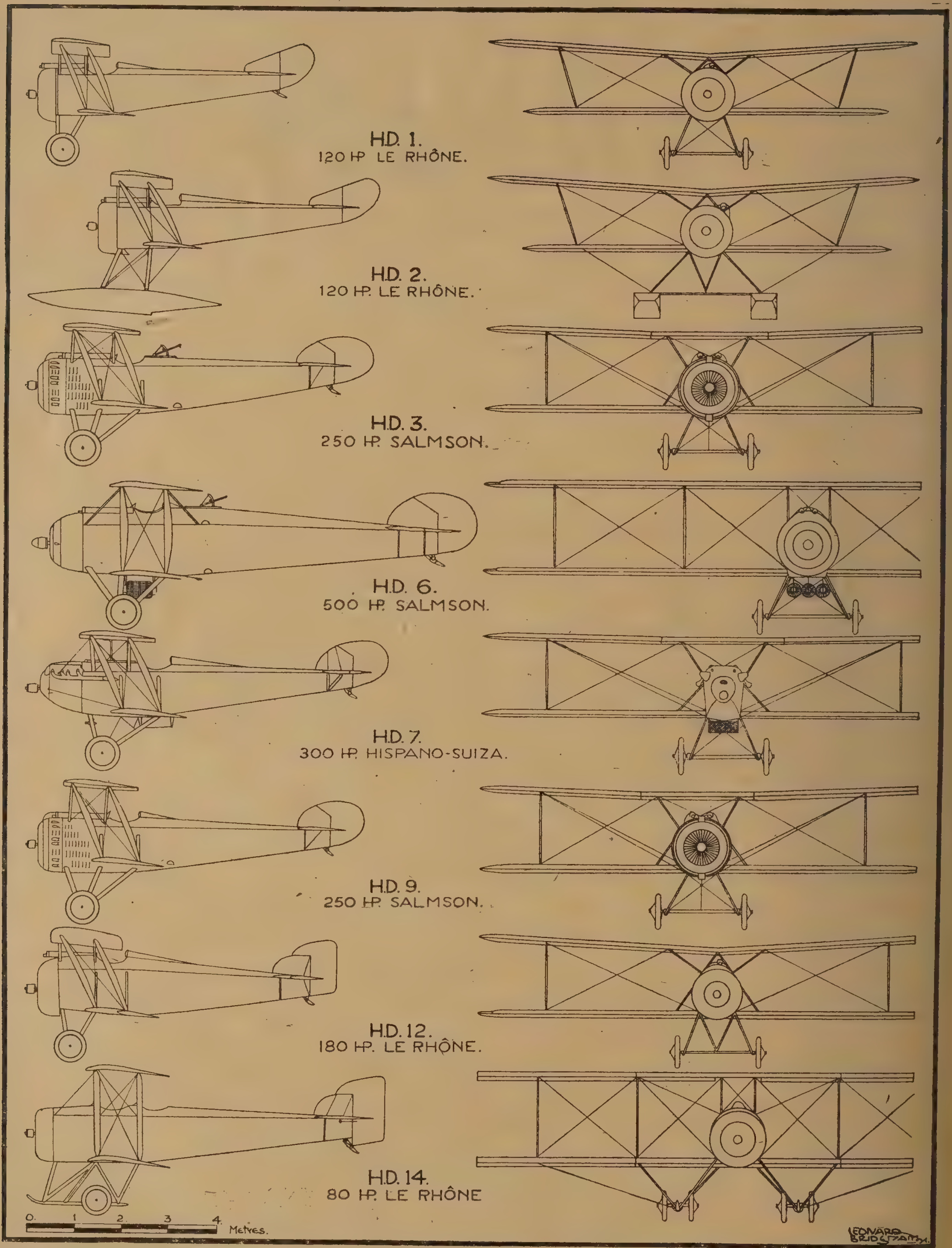
# HANRIOT AIRCRAFT.



The accompanying drawing shows the front and side outlines of sundry Hanriot aircraft produced both during and since the war. Early in the war the Maison R. Hanriot were engaged in the construction of Sopwith aircraft under licence, and possibly this may account for certain traces of Sopwith influence apparent in the various machines.

At present they are engaged in building the H.D.12 and the H.D.14 for the Ministry of Marine, and are also engaged in producing two all-metal machines, a two-seater fighter and a large biplane for colonial use, either as a bomber or a commercial machine.

The H.D.1 is a small single-seater fighter that was used almost exclusively by the French Navy during the war, as well as by the Belgian Army and the Italian Army, the latter machines being built under licence by the Macchi-Nieuport firm. More recently they have been used for flying off decks and gun-turrets by both the French and American Navies.

Fitted with a 120-h.p. Le Rhône engine, the H.D.1 shows a

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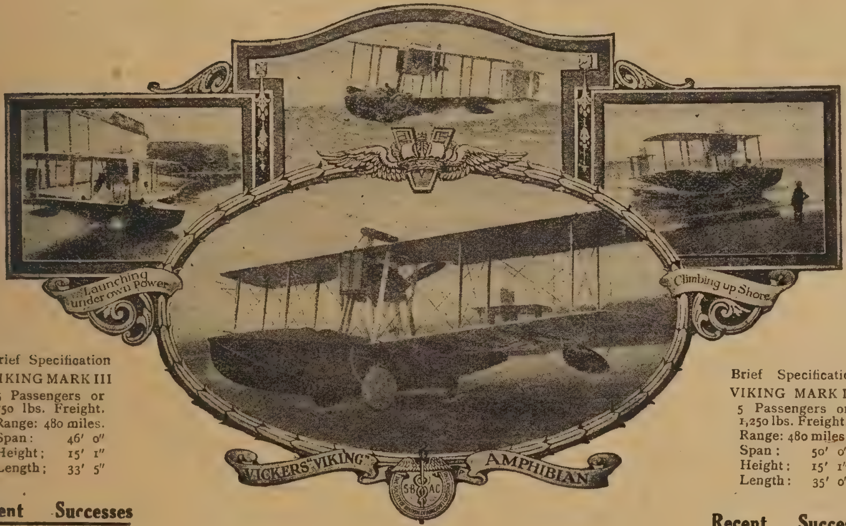

Brief Specification
VIKING MARK III
5 Passengers or
750 lbs. Freight.
Range: 480 miles.
Span: 46′ 0″
Height: 15′ 1″
Length: 33′ 5″

Brief Specification
VIKING MARK IV
5 Passengers or
1,250 lbs. Freight.
Range: 480 miles.
Span: 50′ 0″
Height: 15′ 1″
Length: 35′ 0″

**Recent Successes**

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

1. **Shortest time in "unsticking" from water.**
2. **Fastest time over a given circuit.**
3. **Climb to 1,000 metres.**
4. **Altitude with full load.**

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**GLASGOW—Vickers House, 247, West George Street.**
**BRISTOL—55, Park Street.** **BELFAST—26a, Arthur Street.**
**LEEDS—Greek Street Chambers, Park Row.**
**NORWICH—16, White Lion Street.**

**Recent Successes**

The Vickers Viking was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION September, 1920

Aviation Department,
VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

performance of 186 km.p.h. low down and 176 km.p.h. at 4,000 metres, with a climb to 5,000 km. in 17 min.

Overall dimensions are :—Span (top plane) 8.5 m., bottom plane 7.2 m., length 6 m., surface 18 sq. m.

The H.D.2 is merely an H.D.1 on a pair of long pontoon floats, which puts her weight up to 540 kg. from 400 kg. empty, and to 740 kg. from 610 kg. fully loaded.

The H.D.3 is a two-seater fighter fitted with a 260-h.p. Salmson engine. Her armament consists of two Vickers guns firing through the airscrew and two Lewis guns mounted on a Scarff mounting over the observer's cockpit. At 4,000 ft. the D.H.3 does 200 km.p.h. and has a climb of 5,000 m. in 22 min. Other particulars are :—Span, 9 m.; length, 6.95 m.; surface, 26 sq. m.; weight, empty, 710 kg.; weight, loaded, 1,100 kg. A specimen of the H.D.3 has been fitted with the "Grain" flotation gear for experimental purposes.

The H.D.6 is a high-speed bomber and fighter and as such is fitted with five guns—two Vickers firing through the airscrew, two Lewis on a Scarff ring over the observer's cockpit, and one automatic firing through the floor of the observer's cockpit. The engine is a 500-h.p. type 18.Z Salmson, which is cooled by three Lamblin radiators carried under the fuselage.

The planes are unstaggered and have no dihedral angle; and this machine, together with the D.H.14, are the only two of the series that do not have the Hanriot characteristic of a dihedral in the top plane with a flat bottom plane; an arrangement which, in spite of its stabilising effect, is only to be found in this country on the Westland "Wagtail" and "Weasel."

The estimated performance is 230 km.p.h. low down, 205 km.p.h. at 5,000 metres, with a ceiling of 8,000 metres. Other particulars are :—Span, 13.1 m.; length, 8.55 m.; surface, 47.5 sq. m.; weight (empty), 1,230 kg.; weight (loaded), 1,900 kg.

The H.D.7 is a single-seater fighter fitted with the 300-h.p. Hispano-Suiza engine, and is very similar to the H.D.3, except for the single-seater arrangement, the slightly enlarged dimensions and the different cowling. The specification is as follows :—Span, 9.8 m.; length, 7.25 m.; surface, 28 sq. m.; weight (empty), 813 kg.; weight (loaded), 1,150 kg.

The H.D.9 is a single-seater version of the D.H.3, and barring the closing of the observer's cockpit is exactly the same both as regards dimensions and performance.

The H.D.12 is an improvement of the H.D.1, and is now being produced for the French Navy for ship-flying and other purposes. An 180-h.p. Le Rhône has been substituted for the 120-h.p. engine and the dimensions slightly increased. Ailerons are fitted to the bottom plane only and all control surfaces are balanced. Two Vickers guns are fitted in the cowling to fire through the airscrew.

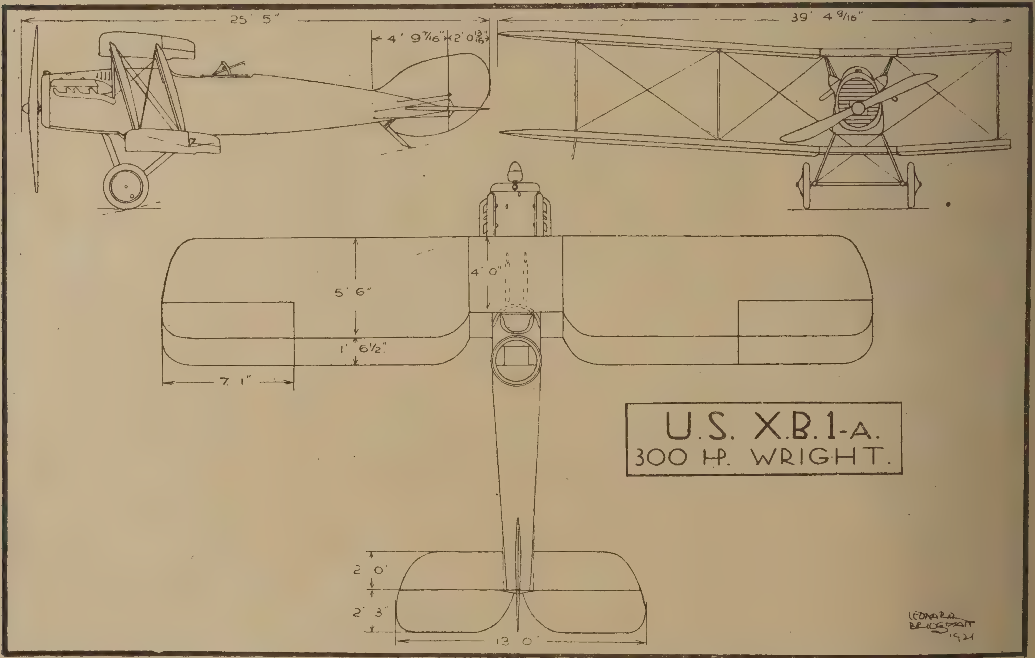
The principal dimensions are :—Span, 9.6 m.; length, 6.95 m.; surface, 25 sq. m.; weight (empty), 480 kg.; weight (loaded), 690 kg.

The H.D.14 is a dual control school machine, fitted with an 80-h.p. Le Rhône. The construction is in wood and is very simple and robust. The planes are made interchangeable and are easily taken down. The four ailerons of metallic construction are all interchangeable. Two separate undercarriages are fitted under each first set of interplane struts, and strongly wire-braced to the fuselage and have a track of 4 metres.

The dual control is original in that the two joy-sticks are interconnected by two tubes, one running inside the other. When the dual control is in operation the two tubes are locked solid by three sliding projections on the outer tube which fit into holes in the inner tube. The projections are controlled from the pilot's seat by Bowden control acting against springs so that by a movement of a lever which is fitted with an eccentric it is possible for the pilot to throw the pupil's controls out of action.

The principal particulars are :—Span, 10.4 m.; length, 7.25 m.; surface, 34.5 sq. m.; weight (empty), 516 kg.; weight (loaded), 710 k.g.; speed, max., 116 km.p.h.; landing speed, 52 km.p.h.; ceiling 2,000 m.—L. B.

# AN AMERICAN VERSION OF THE BRISTOL FIGHTER.



## The U.S. X.B.1a.

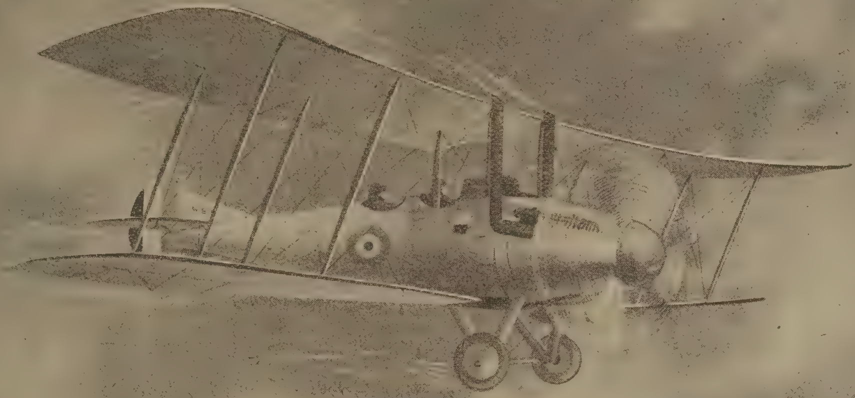
The latest type of observation aircraft to be used in the U.S. Army Air Service is known as the U.S. X.B.1a, and specimens of this type, equipped for night-flying, will shortly be sent to Army Air Service units operating on the Mexican border.

It has been developed by the Engineering Division, U.S. Air Service, from the drawings of the Bristol "Fighter" which, with plans of other Service aircraft, notably the D.H.4, D.H.9a, S.F.5a, and H.P. O/400, were supplied to the U.S. Government on their entering the late European war.

Originally the Bristol "Fighter" was experimentally fitted with the 400 h.p. Liberty with a view to its going into production in 1917, but owing to disastrous results was branded as dangerous.

Since then changes have been made from time to time with the result that the X.B.1a now resembles the Bristol F.2b in outline only. The principal modification is made in the fuselage, which is constructed of three-ply throughout. The form is slightly changed, the cross-section, aft the observer's cockpit, being oval rather than square, having had the sharp corners rounded off.

BEARDMORE



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AEROPLANES

The fins are built of three-ply integral with the fuselage, the lower fin having the unsteerable tail skid pivoted to its forward edge. A 300-h.p. Wright-Hispano engine is carried in the nose.

The undercarriage remains the same in principle with the exception that the front leg of the Vee slopes forward and is anchored to the fuselage at a point directly under rear engine-bearer mounting.

The plane surfaces remain the same as the Bristol "Fighter."

The X.B.1a has been tested to show 133 m.p.h. at ground level, 129 m.p.h. at 6,500 ft., and 83 m.p.h. at 22,400 ft., compared with the Bristol "Fighter," which has a speed of 119 m.p.h. at 6,500 ft and 105 at 15,000 ft. The X.B.1a climbs to 15,000 ft. in 19 min., compared with the Bristol figure of 20 min. 20 sec. to 15,000, and the D.H.4b of 24 min.

SPECIFICATION.

| | |
|---|---|
| Span | 39 ft. 4 9/16 in. |
| Height | 9 ft. 9½ in. |
| Gap | 5 ft. 5 in. |
| Dihedral | 3½ deg. |
| Chord | 5 ft. 6 in. |
| Length | 25 ft. 6 in. |
| Area of planes | 405.6 sq. ft. |
| Stagger | 1 ft. 6 in. |
| Wing curve | Mod. R.A.F.15 |
| Area of ailerons (4) | 52 sq. ft |
| Area of elevators | 11.5 sq. ft. |
| Area of fin | 10.3 sq. ft. |
| Area of tail plane | 22.5 sq. ft. |
| Area of rudder | 7.2 sq. ft. |
| Max. cross-section of body | 8.3 sq. ft. |
| Engine type and h.p. | Wright type H, 300 h.p. |
| Oil capacity | 1.2 gall. |
| Petrol capacity | 54 gall. |
| Weight (empty) | 2,010 lb. |
| Weight (loaded) | 2,994 lb. |
| Weight pr sq. ft. | 7.38 lb. |
| Weight per h.p. | 9.98 lb. |
| Endurance at 10,000 ft. (full throttle including climb) | 2.4 hr. |
| Minimum speed | 59 m.p.h. |
| Maximum speed (ground level) | 133 m.p.h. |

# NOTES FROM AMERICA.

## An Indicator for Aero Engines.

Designers of steam engines for all purposes where high efficiency is of importance have long used the steam engine indicator to give them exact information as to what actually happens within their engine cylinders.

The steam engine indicator, as most people know, draws a diagram which shows the pressure developed within the cylinder at every point in the cycle of operation. Similar instruments have been used on gas and other internal combustion engines, but owing to the very great range of pressure developed in such engines, and the extraordinary rate at which the pressures change at ignition, they have failed to give really satisfactory results.

The inertia of the moving parts of the ordinary type of indicator prevent a reliable record from being made. For high-speed engines such as are used in aeronautical work this effect is very marked, and no indicator of the steam engine type has ever been satisfactory.

Special types of indicators have been devised, notably by Professor Hopkinson in this country, but no really satisfactory indicator for aircraft engines has yet been produced, largely because vibrations of that part of the engine to which the indicator is attached have interfered with the accuracy of the records.

The American National Advisory Committee for Aeronautics have just published, in a report numbered 107, a description of a novel indicator designed specially to meet aero-engine conditions. Essentially this consists of a very light and flexible metal diaphragm carried between supporting grids which give to it a very small range of movement. This diaphragm is fitted into a plug which screws into a spark plug hole in the cylinder, so that one side of the diaphragm is open to cylinder pressure.

The other side is coupled to a regulable air pressure system. If during any part of the stroke the cylinder pressure exceeds the air pressure on the opposite side of the diaphragm, the diaphragm is forced against the upper grid, whose central part is electrically insulated from the body of the mechanism. The diaphragm is thus made to act as a switch in a telephone circuit.

Included in the telephone circuit is a timing mechanism consisting of an insulating disc, rotated from either the camshaft or the crankshaft of the engine, bearing a very narrow contact sector which can be adjusted to any desired angular position relatively to the crank- or camshaft.

The method of using the instrument is as follows:—The timing disc is adjusted to some definite position, say top dead centre for the cylinder considered. Air is admitted to the upper side of the diaphragm at some pressure less than that known to occur in the cylinder at that point. The diaphragm is then forced against the contact at each top dead centre, and the timing contact opens and closes the telephone circuit, causing a pair of clicks in the receiver. The air pressure on the top of the diaphragm is gradually increased until it becomes equal to the cylinder pressure at the particular point being considered, and the diaphragm then fails to touch the upper contact at that point, the circuit is broken and the clicks cease.

The pressure on the top of the diaphragm is noted, using a reliable pressure gauge, and the timing device is moved on to a new position, and the pressure at that position again noted. By taking a number of consecutive points round the whole cycle a complete diagram can be plotted.

Owing to the very small range of movement permitted to the diaphragm, it is possible to make it extremely light and sensitive, and it is claimed that the time lag and other errors due to inertia are negligible, and that records can be made satisfactorily up to speeds of 2,600 r.p.m.

Such an instrument is obviously likely to be a very valuable aid to accurate experimental investigation of the habits of aero engines.

## A Revolution in Flying.

The Hall Aeroplane Company, domiciled in that home of stars, Los Angeles, Cal., announces that it has been formed to exploit the aeronautical inventions of Mr. Charles S. Hall and thereby to revolutionise the art of flying.

A statement due to the said Mr. Hall, explicative of his proposals, conveys so large an amount of interesting and novel information that it seems desirable to extract therefrom some of the more striking contents for the edification of European explorers in the field of aeronautics. The opening sentence of this statement begins:—

"Since 1787, when the helicopter, the first form of airship, was flown . . ." Neglecting, as probably a mere Americanism, the definition of a helicopter as a form of airship, this can scarcely fail to come as a severe shock to Messieurs Damblanc, Oemichen, and Pescara.

But Mr. Hall is by no means dismayed by his discovery of this early realisation of the helicopter, for he has conceived the ingenious plan of combining the helicopter with the aeroplane, and thus producing a type of aircraft possessing all the virtues and none of the vices of both types.

The Hall machine can scarcely be described adequately in other terms than those of the inventor, and a few judicious excerpts from his statement are therefore appended.

"It (the Hall machine) is a combination of the helicopter and aeroplane, so this makes the machine the practical flying machine of to-day. . . . The shape of the wings makes it possible to place any size helicopter propeller therein. . . ." [Evidently the wings have qualities analogous to those assigned to the universe by Prof. Einstein.—Ed.] "The radiator offers no resistance, as it is a series of fins on the front of the fuselage. . . .

"The helicopter propeller is a new scientific development; it differs from ordinary propellers as it works on the vacuum and air compression principle. These results are obtained due to the fact that the hub starts taking hold of the air and compresses it all the way to the tips.

"There are no other such principles employed in other types of propellers." [One willingly believes it.—Ed.] "The efficiency of vacuum is very powerful. . . . A foot would approximately give a ton lift." [Size of boot worn is not mentioned.—Ed.]

"The air passes directly down from helicopter in upper wing, through lower wing; there is no air striking the side of lower wing, as air from any kind of propeller travels in a straight line, due to its speed, as the lower hole is slightly larger." [This statement appears to cover a highly important discovery. The exact extent of the slight larger-ness of lower hole needed to secure a straightened slip stream is unfortunately not disclosed.—Ed.]

"The operation is simple: the pilot starts engine with automatic starter and . . . then steps engine up to 700 or 800 r.p.m., then with foot clutch throw in helicopter propeller, then move engine throttle, and the motor speeds up to normal and the ship starts to rise vertically. When the proper altitude is reached, the helicopter propeller is released with one foot, the front propeller clutch is thrown with the other foot, then sliding wings are closed. This utilises the holes as flying surface and enables the machine to fly without changing angle of incidence of wing, also streamlining helicopter increases the machine's speed."

[Without in the least casting doubt on the accuracy of Mr. Hall's statements, there seems to be an unnecessary amount of footwork about this operation. If, as the author claims, one foot will lift nearly a ton, why not use the pilot's feet for this important business, instead of diverting them to the purpose of throwing clutches and propellers about in this reckless fashion.—Ed.]

"When the power is changed to the front propeller the machine is slightly nosed over; this gives the machine a forward speed; the machine cannot be turned in the air by high winds due to the automatic stabiliser." [It would seem discreet, however, not to use a stabiliser producing such undesirable effects.—Ed.]

"The machine's gliding efficiency will depend on the type of machine and what it is designed for. Some machines will

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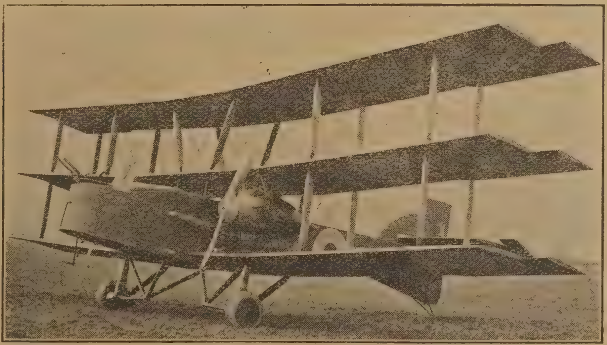

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glide with engine shut out from 10 to 1 or up to 20 to 1 or more. In other words, a machine a mile high could travel 20 miles to land without engine." [This seems hard on the unfortunate engine.—Ed.] "This would give a radius in a circle of 40 miles in which to pick out a landing place." [An insufficient acquaintance with Einsteinian geometry forbids comment on the properties of this curious circle.—Ed.]

"Five years ago to accomplish this would have been considered absolutely impossible" [Concur heartily, though a little vague as to what particular item in the statement this refers to.—Ed.], "but in the last few years there has been much advancement in the development of aircraft engines of high power and low weight. Just recently I learned of the invention of a motor for which it is claimed that the greatest mechanical power and efficiency can be obtained with a reduction of weight never heretofore made possible.

"It is understood that the engine is of the greatest simplicity in design and the number of moving parts; that it has no valves, cam shaft, and not even a bolt screw or nut within its working parts to get loose" [These items are generally meant to keep tight.—Ed.], "and yet compounds the expanding gas from the highest pressure down to a vacuum; that its combustion of expansion chambers are completely rubbed over twice every revolution, thus eliminating carbon trouble, and that it provides such combustion chambers of ever increasing volume on an ever-increasing radius." [Obviously the engine has the same kind of radius as that of the machine's landing circle. Equally obviously the engine emplacement will require to be of the same kind of shape as the wings to accommodate this ever-increasing radius.—Ed.]

The name of Thomas A. Edison is thereafter called upon, and his opinion that "such a machine . . ., when it is available, will be a serious rival of the automobile," seems under the circumstances to be of an unduly reserved nature.

The concluding sentence of the pamphlet from which the above information has been gleaned runs thus:—

"If you wish any stock in this company at $1.00 per share, it would be wise for you to purchase same at once."

And yet it is said that the selling of gold bricks is a dead industry, even in California.

## CONCERNING HELICOPTERS.

In view of the recent outbreak of helicopter inventors and the publicity which they have attained, Capt. A. Brun, of the Royal Danish Artillery, has written a letter to the editor of *La Conquete de l'Air*, of Brussels, wherein he draws attention to the exploits of the Danish aviator Ellehammer. M. Ellehammer is undoubtedly one of the first successful pilots in that he made a straight flight on a biplane on Sept. 12th, 1906.

The Ellehammer Helicopter was built in 1911, and in 1912 it left the ground carrying a pilot, in the presence of numerous witnesses at Copenhagen.

The machine consisted of a six-cylinder radial engine, designed and built by M. Ellehammer, driving two oppositely rotating lifting elements on one axis, and a control was fitted for feathering the lifting-blades in such wise as allow the pilot to cant the axis in any desired direction. This control, it is stated, functioned satisfactorily, but the machine did not possess sufficient lift to rise more than a few feet from the ground, and no actual horizontal flights were made.

It is also stated that M. Ellehammer proposes now to construct a new and improved helicopter based on his earlier experiments, and that he hopes to achieve therewith still more striking results.

## BOOK REVIEWS.

Foreign Trade Tables, 1921. Compiled by A. J. Lawson, M.I.C.E., for the British Italian Corporation Ltd. Published by Thos. Skinner and Co., Gresham House, Old Broad Street, E.C.2. Price 21s. net.

This work, which is published for the express purpose of facilitating trade between Britain and countries which use a more rational system of coinage and of weight and measures, is in effect a very complete set of conversion tables from British units into metric units, and from British coinage into the currency of practically every other nation under the sun.

To attempt to catalogue its contents would require quite a large amount of space, but to illustrate its completeness it may be stated that it is possible by use of the tables it contains to convert a British quotation for steel, expressed in £ per ton for steel whose quality is expressed in tons per sq. in. ultimate stress into one in francs, liras, Mexican dollars, milreis or the like per 1,000 kg., specifying the strength in kg. per mm. square without any arithmetical work other than addition.

In addition to the actual tables it contains there is a large amount of useful data embodied in notes and articles relating to the bases of measurement under the various systems.

The whole is printed in both English and Italian, having been specially devised for the use of British Italian traders, but it should prove extremely useful to all those who have to trade abroad. And not only to traders, for very many of the tables will be of great use to engineers.

The Yearbook of Wireless Telegraphy and Telephony, 1921. (Published by the Wireless Press Ltd., 12-13, Henrietta Street, W.C.2. Price 21s. net.)

The 1921 edition of this extraordinarily comprehensive yearbook has just been published. Like its predecessors the present edition contains a vast amount of information as to the history of wireless, and the laws and regulations governing the use of wireless and the operation of wireless services throughout the world; with complete lists of the existing land and ship stations, their wave lengths and call signs.

Of the greatest interest to the readers of this paper is the Aviation Section—a new feature, if one remembers aright. This section includes an article by Lt.-Col. H. B. T. Childs on Wireless Telephony applied to commercial aviation, dealing with the uses of the system for the supply of meteorological information and for direction finding, together with descriptions of the installations required for this purpose.

In addition is a list of aviation wireless stations throughout the world, with all necessary information as to call sign, wave length, range, etc., and one of aircraft fitted with wireless telephones.

A very complete statement as to the long distance wireless intercommunication system which the U.S. Air Service propose to have in operation in 1922 is also given.

The book cannot fail to be of value to all those interested in wireless, and must be almost a necessity to those who are professionally concerned with wireless work.

## TRADE NOTES.

### The R.A.F. Pageant in Egypt.

The photograph here reproduced shows the Vickers "Vimy" which was publicly exhibited at the R.A.F. pageant held at Heliopolis on March 3rd and 4th. The Egyptian representative of Vickers Ltd. was in attendance at the pageant to give visitors full information as to this machine, and had provided an additional private exhibit of photographs.

**The "Shell" display at the Heliopolis Pageant. Note the overcoats, when we here were in Summer clothes.**

A further example of the fact that all British firms are not devoid of enterprise is to be found in the fact that the Asiatic Petroleum Company Ltd. provided the whole of the Shell spirit, and the Vacuum Oil Company the lubricating oil used during the display, free of all cost, and the photograph provides evidence that the opportunity of making public the virtues of "Shell" was fully employed.

### Steel Tubes.

One learns that the Oriental Tube Co. Ltd. of Birmingham has recently been acquired by the General Electric Co. Ltd., Magnet House, Kingsway, W.C.

This company has gradually developed into one of the largest firms of Steel Tube Manufacturers in Great Britain, and much of this success is due to the untiring energy and business acumen of the retiring Managing Director, Mr. E. H. Dowler, who for upwards of 22 years has held that responsible position, and carries with him the good wishes of all.

### Concerning Hacksaws.

Apropos the note in this column as to Thos. Firth and Son's catalogue of "Diehard" hacksaws it was inadvertently stated that the range of tooth pitch of the blades was from 14 to 32 teeth per in. This range is that of hand saw blades only. Heavy power saw blades are made of pitches as coarse as 6 to the inch.

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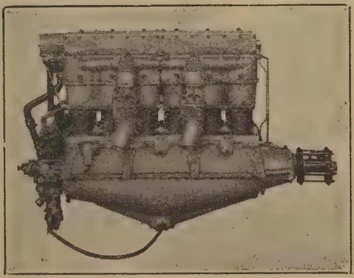

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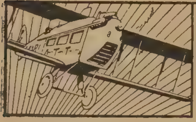

# COMMERCIAL AERONAUTICS
## AND CIVIL AERIAL TRANSPORT.

## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### OFFICIAL NOTICES.

No. 25, March 7th, 1921.—Aerodromes for Civil use: Amendments.

No. 26, March 10th, 1921.—Felixstowe: Salvage operations. Describes these.

No. 27, March 21st, 1921.—Aerodromes for Civil use: Amendments

No. 28, March 21st, 1921.—Pilot's licences: Compulsory examination in Navigation.

No. 29, April 1st, 1921.—Castle Bromwich Aerodrome: Landing Area and Marking. Notification that part of the aerodrome is not available for landing.

No. 30, April 1st, 1921.—Wireless Direction Finding Stations: British Isles.

No. 31, April 1st, 1921.—Summer Time, 1921: British Isles, France and Portugal. Notification of operation of Summer Time in countries stated.

No. 32, April 1st, 1921.—France: Flying of Captive Balloons on the St. Inglevert-Paris route.

No. 33, April 1st, 1921.—Aerodromes for Civil Use: Consolidated list. Gives the quarterly complete list of aerodromes available for Civil use. Cancels all previous lists.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M): next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A—Messageries Aeriennes; I.A.L.—Instone Air Line; S.F.S.—Surrey Flying Services; G.E.A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco-Roumanie, M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

**APRIL 4th:**

M.A., Salmson, F-CMAN, London-Paris, 12.45-15.00, G., Nil, Briere.
S.N.E.T.A., DH9, O-BELG, London-Brussels, 12.50-15.00, G.&M., Nil, Van Opstal.
I.A.L., DH18, G-EARO, London-Paris, 13.01-15.15, G.&M., 2, Chattaway.
M.A., Breguet, F-CMAG, London-Paris, 15.14-17.25, Nil, 2, Rauge.
S.N.E.T.A., DH9, O-BEAU, Brussels-London, 11.57-15.45, G.&M., 2, Sahnovsky.
G.E.A., "Goliath," F-FHMY, Paris-London, 12.35-15.53, G., 10, Labouchere & 1.
M.A., Breguet, F-CMAH, Paris-London, 12.50-16.02, Nil, 4, Le Men.
M.A., Breguet, F-CMAF, Paris-London, 12.53-18.15, G.&M., 2, Le Sec.

**APRIL 5th:**

M.A., Breguet, F-CMAC, London-Paris, 12.50-14.56, G., Nil, Charpentier.
S.N.E.T.A., DH9, O-BEAU, London-Brussels, 13.09-15.15, G.&M., 3, Sahnovsky.
G.E.A., "Goliath," F-FHMY, London-Paris, 13.10-15.15, G., 4, Labouchere & 1.
M.A., Breguet, F-CMAH, London-Paris, 15.10-17.17, Nil, Nil, Le Men.
S.N.E.T.A., "Goliath," O-BLAN, Brussels-London, 11.45-15.20, G.&M., 3, Wouters & 1.
I.A.L., DH18, G-EARO, Paris-London, 12.00-15.05, Nil, 8, Chattaway.
M.A., Breguet, F-CMAI, Paris-London, 13.45-16.48, Nil, 3, Challoux.
M.A., Salmson, F-CMAE, Paris-London, 12.45-16.20, G., Nil, Rauge.
M.A., Spad, F-CMAV, Paris-London, 14.30-17.16, M., 2, Malfanti.

**APRIL 6th:**

M.A., Breguet, F-CMAF, London-Paris, 12.55-15.27 Nil, 2, Le Sec.
M.A., Salmson, F.CMAE, London-Paris, 12.56-15.27, G., Nil, Rauge.
M.A., Breguet, F-CMAI. London-Paris, 13.00-15.28, Nil, 2, Challoux.
S.N.E.T.A., "Goliath," O-BLAN, London-Brussels, 13.00-16.04, G.&M., 2, Wouters & 1.
I.A.L., "Vimy," G-EASI, London-Paris, 13.05-15.45, G.&M., 11, Powell & 1.
G.E.A., "Goliath," F-GEAC, Paris-London, 12.45-16.56, G., 7, Patin & 1.
M.A., Breguet, F-CMAC, Paris-London, 13.45-16.25/7th, G.&M., 2, Briere.
S.N.E.T.A., DH9, O-BATA, Brussels-London, 11.54-14.45, G.&M., 1, Delzenne.

**APRIL 7th:**

G.E.A., "Goliath," F-GEAC, London-Paris, 12.40-16.20, G., 2, Patin & 1.
M.A., Spad, F-CMAV, London-Paris, 12.55-15.25, Nil, 1, Malfanti.
S.N.E.T.A., DH9, O-BATA, London-Brussels, 13.00-16.50, G.&M., Nil, Delzenne.
I.A.L., "Vimy," G-EASI, Paris-London, 11.42-14.36, Nil, 8, Powell & 1.
S.N.E.T.A., DH9, O-BEAU, Brussels-London, 12.15-13.50, G.&M., Nil, Sahnovsky.
M A., Breguet, F-CMAH, Paris-London, 12.20-15.05, Nil, 3, Charpentier.
G.E A., "Goliath," F-FHMU, Paris-London, 12.50-15.26, G., 5, Favreau & 1.
M.A., Breguet, F-CMAG, Paris-London, 12.50-15.21, M., 3, Le Men.

**APRIL 8th:**

M.A., Breguet, F-CMAG, London-Paris, 12.39-15.30, Nil, 3, Le Men.
G.E.A., "Goliath," F-FHMU, London-Paris, 12.40-15.50, G., 6, Favreau & 1.
M.A., Breguet, F-CMAC, London-Paris, 12.41-15.10, G., 2, Briere.
S.N.E.T.A., DH9, O-BEAU, London-Brussels, 13.00-16.30, G.&M., Nil, Sahnovsky.
I.A.L., "Vimy," G-EASI, London-Paris, 13.23-16.05, G.&M., 10, Chattaway & 1.
S.N.E.T.A., "Goliath," O-BLAN, Brussels-London, 12.03-14.45, G.&M., Nil, Wouters & 1.
M.A., Spad, F-ABHP, Paris-London, 13.16-15.25, G.&M., Nil, Le Sec.
M.A., Breguet, F-CMAI, Paris-London, 15.15-18.10, Nil, 4, Challoux.
G.E.A., "Goliath," F-GEAD, Paris-London, 16.55-19.40, G., 7, Labouchere & 1

**APRIL 9th:**

G.E.A., "Goliath," F-GEAD, London-Paris, 13.10-15.40, G., 10, Labouchere & 1.
M.A., Spad, F-ABHP, London-Paris, 13.15-15.35, Nil, 2, Le Sec.
M.A., Breguet, F-CMAH, London-Paris, 14.00—, Nil, 1, Charpentier.
I.A.L., "Vimy," G-EASI, Paris-London, 12.00-14.49, Nil, 11, Chattaway & 1
M.A., Salmson, F-CMAN, Paris-London, 12.50-15.22, G., Nil, Briere.
M.A., Breguet, F-CMAF, Paris-London, 12.50-15.00, M., 2, Le Men.
M.A., Breguet, F-CMAJ, Paris-London, 14.15-16.39, Nil, 3, Rauge.

**APRIL 10th:**

S.N.E.T.A., "Goliath," O-BLAN, London-Brussels, 10.45-13.45, G., 6, Wouters & 1.
M.A., Breguet, F-CMAI, London-Paris, 15.15-18.05, G., 3, Challoux.

### The Air Port of Cricklewood.

**APRIL 4th:**

H.P.T., DH9, G-EAUC, Paris (from Athens) London, 11.55-14.35, Nil, 1, Perry.
H.P.T., HP O/10, G-EATM, Paris-London, 11.50-15.25, Nil, 10, McIntosh & 1.

**APRIL 5th:**

H.P.T., HP O/10, G-EATK, London-Paris, 12.00-14.50, G.&M., 6, Wilcockson & 1.

**APRIL 6th:**

H.P.T., HP O/10, G-EATK, Paris-London, 11.55-15.37, Nil, 4, Wilcockson & 1.

**APRIL 7th:**

H.P.T., HP O/10, G-EATN, London-Paris, 12.05-16.00, G.&M., 10, Rogers & 1.

**APRIL 8th:**

H.P.T., HP O/10, G-EATN, Paris-London, 12.05-15.40, Nil, 4, Rogers & 1.

**APRIL 9th:**

H.P.T., HP O/10, G-EATM, London-Paris, 12.00—, G.&M., 9, McIntosh & 1.

**APRIL 10th:**

NIL.

### Air Port Statistics.

Machines, 58; Passengers, 210; Crew, 78; Total Personnel, 288.

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## Inland Flying at Croydon.

April 4th.—De Havilland Aircraft Company, D.H.6, Stag Lane return (De Havilland); S.F.S., Avro joy-rides (Muir).

April 5th.—S.F.S., Avro joy-rides (Muir).

April 6th.—I.A.L., "Vimy" test (Powell).

April 7th.—I.A.L., D.H.18 test (Barnard).

April 8th.—S.F.S., Avro joy-rides (Muir).

April 9th.—L.A.S., Avro from Leatherhead, joy-rides (Hayns); S.F.S., Avro, joy-rides (Muir); I.A.L., "Bat" from Hendon (Barnard).

April 10th.—L.A.S., D.H.6 from Leatherhead return and joy-rides (Knowles), Avro joy-rides and to Leatherhead (Hayns); S.F.S., Avro joy-rides (Muir).

## Inland Flying at Cricklewood.

April 4th.—Nil.

April 5th.—H.P. test (Wilcockson).

April 6th.—H.P. test (Rogers).

April 7-10th.—Nil.

## The London Terminal Aerodrome.

The S.N.E.T.A. "Goliath," which has been hibernating during the winter, has returned to the London-Brussels service this week. A French "Goliath" provided the star turn of the week as regards sensationalism. Coming over from Paris on Thursday she started to land from the west over the sheds. As she slowly approached the big double hangar, apparently below the level of the roof, strong men wept and women clutched their Pekineses to their breasts. However, the "Goliath" nobly surmounted this obstacle (apparently with the aid of its undercarriage) and then started a steady upward climb, without bothering about its engines.

What happened after this is wropt in mystery, everyone on the aerodrome, fearful of a sight before which a five-reel tragedy would pale into insignificance, buried their heads in the nearest receptacle and tried to forget. When they came to, the "Goliath" was seen to be intact and the smiling passengers, all unconscious of their luck, were being disgorged into the unfriendly arms of the Customs House. And yet there are those who say that the days of miracles are past.

On Saturday Messrs. Cockerell and Broome arrived to take General Sir F. H. Sykes and the Napier Vickers "Viking III" to Paris and alight on the Seine. They then intended to fly back and alight at Westminster the following day. Owing to the strike this was postponed.

On Monday of last week Capt. Geoffrey de Havilland flew over from Stag Lane on a D.H.6 to inspect the De Havilland machines now used by the Instone Air Line. He returned by air.

Capt. de Havilland must be about the only pilot-designer-constructor-director in England, and is certainly one of the earliest of British pilots now flying, seeing that he built his first experimental biplane somewhere about 1908. Incidentally he is, so far as one can discover, the only designer in England to-day who is producing a new type of aeroplane which is at the same time a radical departure from current practice and an obvious flying machine.

### The Instone Air Line.

Mr. Chattaway took the de Havilland 18 to Paris on Monday and returned on Tuesday. Mr. Powell took the "Vimy" over on Wednesday, returning on Thursday, and Mr Chattaway made the return journey with the same machine on Friday and Saturday.

Mr. Barnard had the D.H.18, G-EAUF, the "City of Paris," on test in the air on Thursday and stated that she was excellent in every way.

The Instone Air Line have carried 50 passengers this week as against 44 by H.P.T. and 99 by the French ; S.N.E.T.A. have 17 to their credit.

### The Surrey Flying Services.

On Friday morning Mr. Muir, with oneself as passenger, ascended during the eclipse of the sun. He put the machine up at a very sharp angle and 5,000 ft. was touched in about 5-10 minutes. We did not interfere with the eclipse at all, and permitted it to carry on just as though we were not there. We descended in a very slow spiral glide, and Mr. Muir made one of his usual landings, in spite of the strong wind.

This is one of the highest flights one has had since war days, and one realised how much more pleasant is a flight of this description to any form of stunt flight, whether near the ground or not. At any rate, it is more pleasant from a passenger's point of view.

On Saturday and Sunday Mr. Muir was carrying passengers as busily and as skilfully as usual.

### The Leatherhead Aviation Services.

Mr. Hayns was flying Mr. Chapman's Avro on Saturday in an icy cold wind alternated with April showers.

On Sunday, in beautiful weather, the same machine was carrying passengers, as also was Mr. Knowles on the D.H.6.—G. D.

### A Hint to the Air Lines.

If our lines are to be a success those who are to run them might take note of the fact that the essence of air transport is punctuality. When a business man goes to the expense of travelling by air he does so to save time. Consequently when he is told that his aeroplane is to leave at 12.00 hours he does not expect to be kept waiting till 12.45 or 13.00 hours because somebody wants to tighten a few nuts or readjust a few odd meat-skewers in the cowling.

Sitting around at Croydon waiting for something to turn up does not impress the business man with the business-like qualities of air transport. Therefore, if machines booked to start at 12 cannot be got ready till 12.45 (vide the arrival and departure tables) the best thing to do is to make 11 hours the official starting time and then tell the passengers to be ready at 12. Better keep the machines waiting for the passengers than the passengers waiting for the machines.

One likes the French system of docking the subsidy for every ten minutes' delay in starting.—C. G. G.

### The Petrol Scandal.

How much longer is the Department of Civil Aviation going to be about fitting up proper arrangements for filling the tanks of aeroplanes at Croydon? It is simply ludicrous in these days to see one man pumping petrol from a Bowser tank into an aeroplane while another with a truck-full of two-gallon tins pours the contents of the tins into the Bowser.

Why is there not a bulk storage reservoir with pumps to one gravity tank on the aerodrome itself and another by the sheds? Or, if the D. of C.A. is looking forward to the day two or three years hence when the Air Traffic offices will shift across to what are now the Disposal Co.'s premises at Waddon, why not fix up temporary tanks and pumps of reasonable capacity, which can be shifted to Waddon in due course?

If the D. of C.A. can afford to spend £22,000 on a mooring mast for airships in Egypt and £11,000 on levelling a civil aerodrome in Malta, surely to goodness it can afford £250 or so for decent petrol supply arrangements at Croydon. It is always well to take the long view and look well ahead, as in the case of the spending of tens of thousands on ground work for an air line to Egypt which may be useful five or ten years hence, but the man who never looks anywhere except miles ahead is rather apt to trip over the little things which are right under his nose.—C. G. G.

## The Air Mails.

The Postmaster-General announces that on and from Monday, April 10th, the air mail from London to Brussels will leave earlier than at present. To be included in the mail postal packets should be handed in at the London chief office not later than 08.15, or posted at a London district office in time for the early morning collection (at or about 06.00), or elsewhere in London overnight. In the country packets must be posted in time to be forwarded in dispatches due to reach the London train terminus not later than 07.00.

The Dutch Postmaster-General announces that the extra charges for the international air mail service will be for Belgium 10 cents. (2d.); Great Britain, Ireland, France and Germany, 15 cents. (3d.); Denmark, 25 cents. (3d.), all per 20 grammes (about ¾ oz.).

## London-Athens-London on a De Havilland.

Details are now to hand of the comparatively recent flight by Mr. H. H. Perry on a de Havilland 9 from London to Athens and back. The machine was hired by Mr. W. B. Leeds, son of Princess Christopher of Greece, Mr. Leeds wishing to go from America to Athens for what was known in the army as urgent private affairs.

Mr. Perry flew to Paris, where he picked up Mr. Leeds, and, restarting, he reached Athens by way of Lyons, Nice, Rome, Brindisi and Agrennon. His total flying time from London to Athens was 21 hr. 35 min.

While in Athens, Mr. Perry made several exhibition flights and carried several Greek royal personages as passengers.

The return flight was made with stops at the above-mentioned places as before, and the flying time was 19 hr. 5 min.

Mr. Perry, who is supposed to have done the greatest known amount of flying time for warrant officers and N.C.O. pilots in the Royal Air Force, was the pilot of the D.H.9 which flew to Bucharest and back last year. The Athens flight was arranged by Handley Page Transport, Ltd., and the machine was hired from that firm.—G. D.

## Stag Lane.

On Friday last, Capt. Shaw was busy all day testing the D.H.14 with the Rolls-Royce "Condor." The machine is one of the three ordered by the Air Ministry, and as regards control, Capt. Shaw says it is very like the D.H.18. He spoke very highly of the performance of the machine

The D.H.18, which is now only awaiting the installation of the Napier engine, is a very fine looking machine, and is finished off in the best "all pink inside" method. It has "D.H.18" painted on each side in a "lozenge" similar to the old "Airco" sign.

The monoplane is rapidly taking shape and has the Napier engine in position and the undercarriage fitted. The pilot and navigator sit right forward immediately behind the engine, and then comes the saloon for 10 passengers, though probably more could be carried. Aft the saloon is a gunner's position, as the machine unfortunately is to be a Service machine and not for air lines as had been hoped.—G. D.

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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... 361
Arrol-Johnston, Ltd. ... *Front Cover*
Auster, Ltd. ... *Front Cover*
Beardmore Aero Engines, Ltd., The ... *Front Cover*
Beardmore, William, & Co., Ltd. ... 355
Bray, Gibb & Co., Ltd. ... 363
Bristol Aeroplane Co., Ltd. ... 357
Burlington Publishing Co., Ltd., The ... 363
Cunard Line ... 364
De Havilland Aircraft Co., Ltd., The ... 348
Falcon Airscrew Co. ... 361
Fairey Aviation Co., Ltd., The ... 343
Firth, Thos., & Sons, Ltd. ... 359
Green Engine Co., Ltd. ... *Back Cover*
Handley Page, Ltd. ... 359
Imray, Laurie, Norie & Wilson, Ltd. ... 364
Instone Air Line ... 360
MacLennan, John, & Co. ... *Front Cover*
Metal Airscrew Co., Ltd. ... *Front Cover*
Napier, D., & Son Ltd ... 351
Naylor Brothers (London), Ltd. ... 363
New Pegamoid, Ltd. ... 364
Nieuport and General Aircraft Co., Ltd. ... 357
Roe, A. V., & Co., Ltd. ... *Inside Front Cover*
Rolls-Royce, Ltd. ... 347
Rubery, Owen & Co. ... 361
Sankey, J. H., & Son, Ltd. ... 361
"Shell" Marketing Co. ... 345
Supermarine Aviation Works, Ltd., The ... *Back Cover*
Titanine, Ltd. *Front Cover & Inside Back Cover*
Vickers, Ltd. ... 353
Wakefield, C.C., & Co., Ltd. ... 348

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# THE AEROPLANE

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## ON THE PRESENT STATE OF AFFAIRS.

Perhaps the most amusing features of the national crisis through which we are passing has been the haste with which pilots and observers of the R.A.F. who a few months ago swore vehemently by all their gods that they never wanted to see an aeroplane or hear of a war again have rushed off to the Air Ministry to offer their services in case of civil war, and the joy with which those who were so lucky as to be selected for duty have climbed into Service kit and gone off to their allotted stations. The latter must have felt fully rewarded for their patriotism by the fervour with which wives, sisters, cousins, aunts and other feminine appendages have told them that "it is so nice to see them in uniform again."

Truly we are the most warlike nation of pacifists that ever existed, for this rush of volunteers to serve by land, sea and air in another "war to end war" shows that we can go on ending wars in the same way so long as the British people exist. And one believes that the sudden collapse of the threatened General Strike was aided considerably by the fact that the more violent members of the "Triple Alliance" only realised at the last moment that the funny little "John Citizen" of the inimitable "Poy" is in fact Mr. Thomas Atkins of the late lamented war in what are vulgarly called "civvies." When John Citizen gets back into uniform again he become rather a terrible fellow

Similarly, when the amiable, lounging, rather futile lad of the village gets back into his old R.N.A.S. or R.F.C. or R.A.F. kit, instead of being the effete product of our public school system—as preached by the misleaders of the proletariat—he becomes a very fair reproduction of those aerial pirates who were the bane of the quiet-loving inhabitants of the vicinages of our aerodromes and the joy of Mr. Atkins in the Trenches. It is indeed good to see that the spirit of the Flying Services remains after two and a half years of devastating peace very much what it was in time of war.

### Then as Now.

Be it said, the Nation's peril was certainly no less a week ago than it was during the darkest days at the end of March, 1918, when the German Army nearly drove a wedge between the French and British Armies at Amiens. For behind the threat of the Triple Alliance Strike was a very carefully organised conspiracy for a Bolshevik rising. And the Nation has been saved by the War Office just as it was saved by the War Office three years ago, in spite of the Politicians.

Three years ago the Politicians, led by Mr. Lloyd George, starved the Army in France by dispersing men and munitions all over the Near East in futile side-shows, and by keeping at home able-bodied young men who ought to have been conscripted two years before and who are to-day the backbone of the Bolshevik movement in this country. The result was the breaking of the unfortunate Sir Hubert Gough's attenuated Fifth Army and very nearly the defeat of France and England. The situation was saved by the War Office which rushed over to France every man of our Home Defence Forces who was fit to march and recalled whole divisions from the "side-shows" in spite of the Politicians.

To-day, while the Politicians, again led by Mr. Lloyd George, have been hesitating and talking and temporising and trying to make bargains between the colliers and the colliery operators the War Office, knowing the strength of the Bolshevik movement, as in 1918 it knew the strength of the German Army, has not waited for the Politicians. It has made the necessary military preparations to ensure peace. And it has secured peace.

### A Memorial to a Great Man.

Also, let it be recorded, though the record will not be found in any paper of the general Press, that the excellent organisation which has been prepared for the feeding of the community is also the work of the War Office, based on the wonderful organisation for the supply and equipment of the Army during the war which made the British Army the envy of the World. That organisation was carried out by Sir John Cowans, whose death on Saturday last deprives this country of one of the greatest men it has produced, albeit his work was not done in the face of the enemy nor in the public eye.

The organisation which is constantly ready to feed England in time of internal strife is a permanent memorial to the man who did as much as any leader in the field to win the war. Though perhaps he did not himself lay down the organisation it was his principles and his system which have made it possible.

### Rights and Wrongs.

As to the rights and wrongs of the argument between the colliers and the colliery operators—who are commonly called coal-owners, which they are not in most cases—one is strictly neutral. One has known many colliers who were good, honest workers and splendid sportsmen. One has met colliery operators who might well sit as models for the pictures of the bloated, heavy-paunched, be-diamonded beasts with shiny hats and fat cigars which one sees in Revolutionary papers and pamphlets as caricatures of Capitalism.

On the one hand the colliers cannot live without adequate wages, on the other the collieries cannot be run at a loss. And the Nation, bankrupted by the follies of the Politicians during the War, cannot pay the wages of colliers who do not produce enough coal to justify their existence, nor can it pay dividends on collieries which are not worth working or are so badly managed as to lose money.

### The Pool Fallacy.

The remedy of a National Pool of profits proposed by the colliers is as futile as the offer of District Pools of profits made by the colliery-operators. There is no more reason why a rich district should pay for the losses of a poor district than that a rich mine in a poor district should pay for the losses of poor mines in that district.

It would be as reasonable to propose a Federation of British Industries in which the Female Clothing Trade—which seems to be doing well, judging by its expenditure on advertising—should hand over a share of its profits to pay dividends and high wages in the Aircraft Trade—which seems to be doing badly, judging by its lack of expenditure on advertising. Or it would be as reasonable to ask the Newspaper Proprietors' Association to pool its combined profits so that papers like the *Sphere* and *Bystander* and *Illustrated London News* and *Sketch*, which appear to be rolling in wealth, should make good the losses and maintain the staffs of the various aeronautical papers, none of which seem to be exactly affluent at the moment. The truth is that no political dodgery can have any permanent effect on the laws of supply and demand or the survival of the fittest.

### Good Out of Evil.

The one consolation to be derived from the whole situation is that out of evil cometh good. Shortage of coal may perhaps bring us nearer to the day when we learn to do without coal, when we use water-power and tide-power for our factories and railways and when we use industrial alcohol for our road and sea and air transport.

Coal and oil supplies will be exhausted in the somewhat distant future, but water supplies and tides will renew themselves and alcohol-producing vegetation can be grown so long as the world itself endures. There is probably enough water-power running to waste in the North of England and Scotland to supply all our factories and railways, but the colliery and oil interests are too powerful to permit us to use it. And so far France is the only country which seems to be taking tide-power seriously as a commercial possibility.

It seems remotely possible that the permanent shortage of coal which will follow the drowning of many mines during the present strike and the subsequent closing of poor mines which will be unable to pay the high wages enforced by the National Wages Board which will be the outcome of the present strike may induce our capitalists and their engineers to look further than coal and oil as sources of industrial power.

If our estimable Controller-General of Supply and Research would only turn some of his superfluous Vote onto experiments with power-alcohol and aero-engines he would do more good than by babbling amiably about steam-plants and helicopters. And he might help to cheapen the cost of flying.

### The Father of Bolshevism.

As for the immediate future, we are obviously far from industrial peace, even though the War Office, assisted by the Admiralty and Air Ministry, has saved us from civil war and anarchy. We happen to live in an unfortunate period when people have learned to read but not to understand. The majority of our manual workers are in favour of working peacefully for a fair living wage, but even they are liable to be misled by agitators.

This thing which we call Bolshevism is not new. The older readers of this paper will remember speeches made at Limehouse by David Lloyd George which when read to-day are indistinguishable from the reddest of modern Bolshevist oratory. Our present Premier may fairly be set down as the father of British Bolshevism.

It is true that those speeches were made before he began to acquire wealth: even before he attempted to do so by little gambles in Marconi shares on the strength of straight tips concerning Government contracts made by a Government of which he was a member. But those Limehouse speeches of his sowed the seeds of which he, the chosen friend of our great Capitalists, is now reaping the harvest. There could be no higher testimony to the soundness, solidity, and solidarity of the British People than that we should have won the War and may even yet win the Peace with such a person as our nominal leader.

### The Misleaders of the Workers.

Naturally the workers also mistrust their alleged leaders. One has oneself heard a certain Trade Union leader who has been prominent during the past few days and who had much to do with calling off the General Strike openly preaching Bolshevism of the Russian brand and referring to the Russian leaders as "our representatives in Russia." And that after standing himself such a dinner in one of our London restaurants as must have cost him nearer twenty-five shillings than five shillings. One wished then that some of the workers who contribute their hard-earned pence weekly to his up-keep could have seen how their money was spent.

It still remains to be seen whether, to quote Lord Derby's latest *bon mot*, the Tory Party has taken in Mr. Lloyd George or whether Mr. Lloyd George has taken in the Tory Party. But it remains a fact that the miners would rather deal with a Government of old-fashioned Tories than with any other, for nobody is quicker to recognise a gentleman when he meets him than is the British working man. The workman knows that he will always get honest treatment from a Tory of the old school, and he knows that few of the present Government bear any resemblance to the genuine Tory.

Moreover, let it be remembered that what finally broke the threatened strike was a meeting between the miners' leaders and a number of free and independent Members of Parliament who acted on their own initiative after Mr. Lloyd George and his blandishments and mock-heroics had failed miserably to make any impression on the representatives of the workers. These representatives knew that Mr. George's talk was just talk and nothing more, but when they met the independent Members of Parliament they recognised the fact that they were dealing with the real representatives of the people. Then for the first time they got straight talk from man to man, and the wiser of the men's leaders acted accordingly.

In the end the plain common sense of the average British workman will triumph and we shall come back to payment by results to the man who takes a pride in his work. But it is as well that until that time we have the War Office to protect us against the otherwise inevitable results of the foolishness of the misled workers, the knavery of their self-imposed leaders, the greed of our capitalists and the feeble trickery of our politicians.

### Delayed Progress.

Meantime, of course, aviation suffers. Air transport is not yet recognised as a national, let alone an Imperial, necessity. It says much for those concerned with aviation that progress is as great as it is. For this progress we have to thank the Air Ministry, for the commercial community as such has done nothing to help though it was very nearly frightened into doing something a few weeks ago.

It is curious how all things do work together for good. Undoubtedly the present botched-up temporary air service between London and Paris did stop the formation of the proposed great National Air Transport Company. But the present strike would almost certainly have stopped it still more effectually. Consequently it has turned out in the end that the present temporary arrangement has been for the best.

But the prolongation of the general trade depression which must follow the strike will cause yet another delay in the development of Civil Aviation. As soon as the present troubles are definitely settled it will be the task of all concerned with aeronautics to set to work as they never worked before to popularise aviation. There is much to be done and little time in which to do it if any effect is to be felt this year. The Air Ministry, the Royal Aeronautical Society and the Royal Aero Club must all do their part, and do it vigorously if we are to regain the time lost by the present disturbances. One hopes to be able next week to make a few suggestions concerning a possible campaign to this end.—C. G. G.

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## MR. HINKLER'S LATEST FEAT.

A few further particulars are now available concerning Mr. Bert Hinkler's magnificent flight from Sydney to Bundaberg. The machine which he used was in fact the old original single-seater "Baby" Avro on which he did his non-stop flight from London to Turin and his flight thence to Rome and back to London.

The engine was the same old 35-h.p. Green which he has used in all his remarkable flights. That is to say, it is the same engine which was built in 1910 and was used on the Avro triplane and later on the Avro biplane of that period. This engine has also been used constantly in all the experimental work with the first of the "Baby" Avros and in all Mr. Hinkler's touring up and down England on this machine. Undoubtedly this engine has a record for age combined with actual distance flown which is unapproached by any other individual engine in the world.

Before starting for Australia the Avro Company and Mr. Hinkler in conjunction made certain alteration to the "Baby" Avro which one believes mark a distinct step forward in the development of the privately-owned aeroplane. The whole front of the machine was altered so that the engine-bearers are now in fact a work-bench on which the mechanic in charge of the machine, who in Mr. Hinkler's case is also the owner and pilot, can do any work desired on the engine without dislodging it from the bearers. Cylinders can be removed without touching the crankcase, or the bottom of the crankcase and crankshaft can be removed without disturbing the cylinders and the upper half of the crankcase. Thus one man can do anything that is necessary to the engine in the way of repairs or adjustments.

As regards the flight itself the distance from Sydney to Bundaberg by rail is about 900 miles, and the time taken by train is 42 hours. Thus Mr. Hinkler, by doing the journey in nine hours, has demonstrated conclusively to the Australian Government that on such a journey as this the aeroplane should be used for mail work, and with such a tiny machine as the Avro the work can be done at a very low price.

Mr. Hinkler's performance proves that his London-Turin flight was not a matter of luck, but was in fact a fair example of what can be done by a good machine and good engine when properly maintained by a good mechanic and handled by a good pilot. Also it shows that Mr. Hinkler is not one of those people who do one meteoric performance and then fade into obscurity. It demonstrates conclusively the fact that he is one of the world's finest pilots, and one looks forward to some very much greater performances by him when he returns to England, as he is expected to do within the next few months now that he has demonstrated to his fellow-countrymen in Australia that his projected flight to Australia was in fact within his capabilities if he had not been prevented by the military situation in the Near East.—C. G. G.

## THE EASTBOURNE MYSTERY.

The mystery of the demolition of the Eastbourne Aerodrome is becoming a trifle clearer. It appears that in 1918 all the original bridging over the dykes was replaced by new timber and that there were about two miles of bridging on the seventy acres of land which composed the original aerodrome.

Major Bernard Fowler, the managing director of the Eastbourne Aviation Company, Ltd., endeavoured to carry on the aerodrome but the amount of flying there in 1919 did not warrant the firm in going to the expense of retaining the land and the sheds. When it was decided that the firm must give up the aerodrome Major Fowler endeavoured to induce the Air Ministry to carry it on, but the Ministry refused to do so. The firm's lease from the ground landlord expired on Lady Day this year, on which date the bridging had to be cleared in order to restore the original boundaries as they existed before the firm secured the aerodrome in or about 1912. Consequently the firm itself was obliged to remove the planking of the bridges. The actual bearers of the bridges are still in position in most cases but there is no planking on them.

Actually it all boils down to the fact that the aerodrome had to be demolished by the Eastbourne Aviation Company Ltd. because the Air Ministry refused to maintain a landing ground in this very important position and the firm was in consequence obliged to hand back the land to the ground landlord in its original state.—C. G. G.

## THE AIR MINISTRY APPROPRIATION ACCOUNT, 1919-20.

The "Appropriation Account, 1919-20," of the Air Services was published on April 16th as a White Paper and contains the Report of the Comptroller and Auditor-General thereon.

The account is unusually complicated as it deals with the financial year which ended on March 31st, 1920, a period when the confusion consequent on the change from war to peace conditions was still at its height. The sums spent in excess of estimate are in some cases very large, but in view of the vast expenditure in aerial matters the wastage must be regarded as comparatively small. It must also be remembered that considerable amounts were saved during the same year though not always with wisdom.

The length of the Account is too great to admit of a detailed examination of its contents. Nor in view of the conditions obtaining in 1919-20 would such examination be of any real value.

Under Vote 1 £116,486 was saved in regard to the pay of officers as the number employed dropped below the estimate. An under-estimation in the matter of allowances led to an additional expenditure of £154,075. In the case of the rank and file their grouping into trades showed that a higher pay average was caused and in consequence there was a deficit of £155,791.

With possibly accidental cynicism "a more economical policy in the assessment of dependents' allowances . . . . " saved £297,362 under Sub-head C (Separation Allowances).

Service gratuities to officers, though no officers appear any the happier, absorbed an additional £859,426, though the original allocation was for £3,000,000. In regard to this expenditure the Auditor-General says that "it appeared that very liberal interpretation had been placed upon the regulations. . . . "

Under Vote 4, Quartering, Stores, etc., it is not surprising to find that the grant of £2,150,000 for clothing was exceeded by £599,188. It is explained as being due to under-estimated war liabilities, and arrear claims from the Admiralty, War Office and the Canadian Government. Those of little faith will think that the frequent redesigning of uniforms had something to do with the extra cost.

Deficits are common in this Vote, but accuracy of forecast in the matter of supply is almost impossible under demobilisation conditions. Therefore comment is useless.

One curious feature is the increase in the number of fires causing heavy destruction of property, fires occurring at eight aerodromes, seven of which were in Great Britain. The total loss due to this cause was over £169,000.

### TECHNICAL AND WARLIKE STORES.

In Vote 3 (Technical and Warlike Stores), though great surpluses were available in many sub-heads, the total Vote showed a deficit of £586,254. This was mainly due to excess expenditure in the purchase of "Aircraft Supplies delivered under War Contracts," the deficit in this case being £1,742,179. Another big deficit is shown under Sub-head 9—Mechanical and other Transport, the grant for which was £23,000 and the expenditure £265,505 10s.

Against this only £456,121 3s. 10d was spent under Sub-head A, Aeroplanes, Seaplanes, Engines, and Spares, out of a grant of £1,413,000. The reason for this was the great delay in the delivery of material ordered and the "excess of service material returned from France."

A deficit of £13,949 in the case of "Balloons, Winches and Spares," is explained as due to an under-estimate of claims from the Admiralty.

The reduction in flying considered necessary in 1919-1920 caused a surplus of £345,824 in Vote J (Petrol and Oil).

At this point it is well to remove a common misapprehension. Many people imagine that money saved on one Sub-head of a Vote can be used to cover deficits on other Sub-heads. This is not the case. Money granted under Estimates is earmarked to the last penny and if not expended on the designed object is returned to the Treasury at the end of the financial year.

*(To be continued.)*

## THE LATE MR. C. D. THOMSON.

Many people in the Aircraft Industry in this country will learn with great regret of the death of Mr. C. D. Thomson, who for two years past represented in this country *Aerial Age* of New York, as London correspondent and as advertisement representative. Recently Mr. Thomson went to New York and joined the staff of *Aerial Age* as assistant editor to Mr. Douglas Wardrop, to whom one believes he was a cousin. Mr. Thomson, who was a Scot by descent, served in the British Army in France and was taken prisoner after being wounded and gassed. Eighteen months in Germany weakened his otherwise robust constitution, and not long after his arrival in New York he caught a cold which developed into pneumonia, with the result that he died within 24 hours.

Though only connected with aviation in this country for a short time, Mr. Thomson made many friends by his straightforward transparent honesty and his directness of speech. His keen interest in aviation and his undoubted business ability would in any time of normal trade have produced good business for his firm. And as it was, the hard work which he did laid a sound foundation for the future.

All will regret the loss of a good soldier and a good sportsman.

## THREE FATAL ACCIDENTS.

Three flying accidents, involving the death of seven occupants of the four machines, were reported over the weekend.

On Thursday, April 14th, in Egypt two Bristol "Fighters" collided in the air, and the four occupants were killed.

On Friday, the 15th inst., Flying Officer Cox, Adjutant of 14 Squadron, whilst taking part in some air manœuvres at Jerusalem, crashed and was killed.

On Saturday, Flying Officer B. F. Deane and Air Mechanic J. F. Elliott, both of the School of Army Co-operation at Andover, fell during a training flight at Weyhill, near Andover, and were killed. The cause of the accident is attributed to engine failure.

**A view of Constantinople, with a Farman "Goliath" in mid-air, photographed from a Farman biplane.**

## CANADIAN PURCHASES IN THE U.S.A.

A paragraph appeared in the American papers recently asserting that the Canadian Air Board had purchased through Mr. Ericson a number of H.S.2.L. seaplanes from the Aero-Marine Company of the United States. Naturally this statement caused some surprise in the British Aircraft Industry, seeing that the H.S.2.Ls. are simply American-built versions of the Felixstowe twin-engined flying-boats designed by the late Lieut.-Col. John Porte, and that under the circumstances the Canadian Government might be expected to buy from the British Aircraft Industry rather than from the United States.

Enquiry in Canada has produced the information that when the United States Navy left the coast-patrol stations which they had established during the war at Halifax and Sydney, Nova Scotia, they left behind about a dozen H.S.2.Ls, a quantity of spare parts and about two dozen Liberty engines. In a truly fraternal spirit this material was handed over gratis to the Canadian Government as presumably the United States did not think it worth removing to the United States.

With these H.S.2.Ls. quite a considerable amount of useful work has been done in Canada. Two of them, for example, were given to Mr. Elwood Wilson of the Laurentide Company and did the work on which was based the very interesting article which that gentleman contributed to this paper on the subject of timber control from the air. Another of these boats was used for a portion of the voyage made by Colonel Leckie from Newfoundland to Winnipeg.

As the Canadian Air Board wanted to use the rest of these boats and as money was not forthcoming from the Canadian Government in adequate quantity to allow of the purchase of new boats, the Canadian Air Board enquired whether spares could be obtained in the States for those of the original dozen boats which were not in use. As a result the makers in the United States sold to the Canadian Government a further dozen H.S.2.L. boats complete but without engines. This will enable the Canadian Air Board to put into commission a number of other boats with the extra engines which were left behind by the United States Navy, and will make it possible to do air work in Canada which could not have been done otherwise owing to the parsimony of the Canadian Treasury.

Incidentally the deal was done direct with the Aero-Marine Company, and not through any intermediary.

It is, of course, entirely regrettable that this air work should be done on American machines instead of on British-built machines, as it will only mean that the Aero-Marine Company will get an excellent advertisement and the time will be brought nearer when Canada will use American aeroplanes instead of British, just as she uses American motor cars instead of British.

It seems possible that if the people in this country who have a surplus stock of flying-boats of the Felixstowe type had had the enterprise to keep in close touch with the requirements of the Canadian Air Board, and if they had been willing to dispose of surplus stock at American prices, the Canadian pilots might by now have been equipped with British built boats. But so long as British business men try to get the price of new goods for surplus stock, or endeavour to sell what they have got instead of attending to the requirements of prospective customers, so long we must expect foreign nations who are either more enterprising or who are more ready to take a sporting gamble to acquire all the business which ought to be ours.—C. G. G.

## SIAM AND THE NAPIER ENGINES.

H.S.H. Major Prince Pridi of Siam, cousin of the King of Siam, is at present in England for the purpose of gathering information to assist Siam in the reorganisation of the Siamese Air Force.

During his stay he took the opportunity of visiting the works of D. Napier and Sons, Ltd., at Acton, where he saw the now world-famous 450-h.p. Napier "Lion" engine during the various phases of its construction, as well as the more recent Napier production, the 1,000-h.p. "Cub." That the latter engine has not got such an array of extraordinary successes to its name as the "Lion" is merely due to the fact that its short existence has only permitted it to put up a splendid performance in the initial bench tests. That it will make a name for itself is an accepted fact, and therefore one can only say that Major Prince Pridi and Mr. Phra Sanpakitch, the first Secretary of the Siamese Legation, who accompanied him, saw in the Napier "Lion" and the Napier "Cub" the latest engine developments in this country.L. B.

## MORE ABOUT BRITISH ENGINES.

Apropos a recent paragraph concerning the great advances made in British aircraft engine design, despite the statement to the contrary by a leader writer in the *Times*, it is well to point out that some considerable time ago the Sunbeam Motor Co. Ltd. of Wolverhampton, produced the 12-cyl. Sunbeam-Coatalen "Sikh" engine which gives 850 h.p. and is therefore in advance of any engine produced in any foreign country. The "Sikh" was not mentioned among the British engines to which one referred in THE AEROPLANE because it existed considerably more than a year ago and the paragraph in question referred to the developments of the past twelve months. Nevertheless, it seems as well to remind those concerned with aviation that the "Sikh" has been in existence for so long and that this materially increases our lead over foreign nations.

It should be remembered also that the Sunbeam-Coatalen "Matabele," giving 400 h.p., had just proved its usefulness at the conclusion of the war, chiefly on French flying-boats, and its performance was remarkable at the Monaco meeting last year when in the Despujols and other motor-boats it proved itself to be the leading motor-boat engine.

Also it is well to recall the fact that the latest of our airships, R.36, is fitted with three Sunbeam-Coatalen "Cossack" engines, the latest editions of those which drove the R.34 across the Atlantic and back, the three "Cossacks" in question being fitted presumably in order to spur the two German Maybach engines which are also fitted to R.36 to a proper spirit of emulation.

Though these facts concerning Sunbeam-Coatalen aircraft engines do not arise naturally from the argument with the *Times*, it seems just as well to recall them to the somewhat short memories of the aeronautical community.—C. C. G.

## "CURIOSER AND CURIOSER."

There have recently appeared in the *Daily Mail* sundry accounts of weird and wonderful new air inventions, some of which bid fair to out-do the Sandringham Hat, both as to utility and net sales. There are, however, some few which the *Mail's* "expert" has either overlooked or which he has up his sleeve for further use. Even if they do not exist, THE AEROPLANE is not going to admit that it has less imagination than the *Daily Mail's* technical secretarial aerodynamical civilian aerial transportative specialist.

First we have the "Crashing Crab" which, when pursued by Mr. Grace or any other A.I.D. inspector, gives forth the cry, "G-EAUK! G-EAPT!" and, with a specially jointed instrument which plays in harmony with the rudder, digs a hole in the ground, from which coign of vantage it pelts its assailant with nuts, and at the same time gazes with derision upon its baffled pursuer.

Then there is the F-FYSM—F-HMFU. This curious avion jumps from precipice to precipice—and back to Paris again, when amidst the plaudits of the doting onlookers it shuffles up, shakes, shocks and finally shoots out shoals of shea-shick schentlemen.

Then there is the "Wild-bird." This air express is said to start on the airway at 12.00. After toying about in the sheds for half of several hours it slowly and opulently galumphs round to the aerodrome while its victims are being anæsthetised in the Trust House. How then does it get away at the advertised time of departure? It doesn't! that's what makes the passengers so remarkably wild!!!

Again there is the new London-Heliopolis airship G-ASBAG. It has too many registration letters because of its length. This curious apparatus is loaded with sand at Pulham, in default of passengers able to pay the exorbitant fares demanded. On arriving at Heliopolis it ejects the sand and water collected at Pulham. Hence the Pyramids! This done it flies to the neighbouring mooring mast, erected at a cost of £22,000 by John Citizen, and demolishes it at one fell swoop. As the mooring mast and the framework of the airship are cleverly designed to be of the same species, the mooring mast is absorbed into the structure of the airship, which thus regains its lost substance and hides all evidence of its victim's shame.

Then there is the Pepa-Potay engine, which is incessantly expected but never arrives. This engine consumes vast quantities of a new essence from the most sultry parts of Mesopotamia. Of such high calorific value is this essence and so efficiently does the engine use it, that any aeroplane fitted with the Pepa-Potay is obliged to fly backwards to cool its exhaust-ports, thus emitting a loud whistling noise. Hence its failure to arrive at its destination.

Moreover, we have the "Rhinopteros." This, ladies and gentlemen, is the most expensive aeroplane in the world. It will be observed that its wings are full of little slots, like a penny-in-the-slot machine. Through these slots the financiers of its construction drop their money. Hence its name—"Rhino," money; "Pteros," a wing—or money-wing. It has no relation to a multiplane, which is merely a device to catch more air.

Finally, there is the new Greek airship S-OSAGE, in which the fabric is so exiguous, owing to the state of Greek finances, that every time it moves its rudder it removes the fabric from its nose-cap. This fabric can only be replaced by fixing the nose of the ship firmly to a mooring-mast (kindly lent by the Department of Civil Aviation), and turning the ship tail to wind so that the skin-friction of the air may draw the fabric to the fore-end again.—C. 3G. D.

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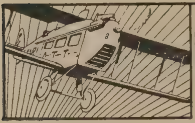
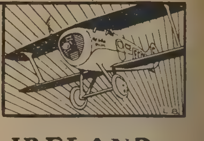


# COMMERCIAL AERONAUTICS
## AND CIVIL AERIAL TRANSPORT.



## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers: and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS.—N.L.A.—Nordiska Luftrederi Aktiebolaget; M.A.—Messageries Aeriennes; I.A.L.—Instone Air Line; S.F.S.—Surrey Flying Services; G.E.A.—Compagnie des Grands Express Aeriens; S.N.E.T.A.—Syndicat National pour l'Etude des Transports Aeriens; P.L.—Petters, Ltd.; Franco-R.—Franco Roumanie, M.W.T.C.—Marconi Wireless Telegraph Company; H.P.T.—Handley Page Transport, Ltd.; H.P.—Handley Page, Ltd.; A.P.B.—Air Post of Banks; K.L.M.—Koninklijke Luchtvaart Maatschappij; B.A.C.—Bristol Aeroplane Co.; L.A.S.—Leatherhead Air Services.

Where times are missing it is probably owing to Atmospherics.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

APRIL 11th:

I.A.L., DH18, G-EAUF, London-Paris, 12.57-15.27, G.&M., 7, Powell.

M.A., Salmson, F-CMAN, London-Paris, 13.00-15.25, G., Nil, Briere.

M.A., Breguet, F-CMAJ, London-Paris, 12.59-15.45, Nil, 3, Rauge.

M.A., Breguet, F-CMAF, London-Paris, 13.01-15.49, Nil, 2, Le Men.

S.N.E.T.A., DH9, O-BATA, Brussels-London, 11.43-14.15, G.&M., 1, Van Opstal.

G.E.A., "Goliath," F-FHMY, Paris-London, 12.45-14.45, G.&M., 5, Labouchere & 1.

APRIL 12th:

M.A., Breguet, F-CMAH, London-Paris, 11 50—, Nil, Nil, Charpentier.

G.E.A., "Goliath," F-FHMY, London-Paris, 12.33-15.29, G., 2, Labouchere & 1.

S.N.E.T.A., DH9, O-BATA, London-Brussels, 13.00-16.01, G.&M., Nil, Van Opstal.

K.L.M., Fokker, H-NABM, Amsterdam-London, 11.15-13.34, G., 2, Olley.

S.N.E.T.A., DH9, O-BEAU, Brussels-London, 11.23-113.37, M, 1, Delzenne.

I.A.L., DH18, G-EAUF, Paris-London, 11.40-13.55, Nil, 5, Powell.

M.A., Spad, F-CMAY, Paris-London, 13.35-15.29, M., 2, Le Sec.

M.A., Breguet, F-CMAK, Paris-London, 13.45-16.15, Nil, 3, Challoux.

M.A., Breguet, F-CMAI, Paris-London, 13.48-16.24, G., 2, Rauge.

M.A., Salmson, F-CMAE, Paris-London, 13.50-16.18, G., Nil, Malfanti.

APRIL 13th:

M.A., Spad, F-CMAY, London-Paris, 12.49-14.40, Nil, 2, Le Sec.

M.A., Breguet, F-CMAK, London-Paris, 12.52-15.03, Nil, 3, Challoux.

I.A.L., DH18, G-EAUF, London-Paris, 12.55-15.25, G &M., 7, Chattaway.

S.N.E.T.A., DH9, O-BEAU, London-Brussels, 13.00-15.14, G.&M., 2, Delzenne.

M.A., Breguet, F-CMAI, London-Paris, 13.08-15.30, G., 2, Rauge.

G.E.A., "Goliath," F-FHMU, Paris-London, 12.48-16.10, G.&M., 9, Favreau & 1.

S.N.E.T.A., DH9, O-BATA, Brussels-London, 12.55-17.03, G.&M., 2, Sahnovsky.

APRIL 14th:

K.L.M., Fokker, H-NABM, London-Amsterdam, 10.17-14.00, G., 1, Olley.

G.E.A., "Goliath," F-FHMU, London-Paris, 13.00-15.10, G., Nil, Favreau & 1.

S.N.E.T.A., DH9, O-BATA, London-Brussels, 13.04-15.15, G.&M., 1, Sahnovsky.

I.A.L., DH18, G-EAUF, Paris-London, 11.25-14.30, G., 6, Chattaway.

G.E.A., "Goliath," F-GEAD, Paris-London, 14.30-19.20, G., 6, Labouchere & 1.

K.L.M., Fokker, H-NABN, Amsterdam-London, 14.17-17.57, G.&M., 2, Hinchcliffe.

M.A., Breguet, F-CMAF, Paris-London, 14.50-19.26, G.&M., 2, Briere.

S.N.E.T.A., DH4, O-BADO, Brussels-London, 14.54-19.28, G.&M., Nil, Van Opstal.

APRIL 15th:

K.L.M., Fokker, H-NABN, London-Amsterdam, 10.25-14.15, G., 1, Hinchcliffe.

S.N.E.T.A., DH4, O-BADO, London-Brussels, 12.44-18.35, G.&M., 1, Van Opstal.

G.E.A., "Goliath," F-GEAD, London-Paris, 12.55-15.14, G., 2, Labouchere & 1.

I.A.L., DH18, G-EARO, London-Paris, 12.51-15.05, M., 3, Powell.

M.A., Salmson, F-CMAE, London-Paris, 15.25-18.00, G., Nil Malfanti.

K.L.M., Fokker, H-NABH, Amsterdam-London, 10.28-13.42, G., Nil, Holmes.

K.L.M., Fokker, H.NABM, Amsterdam-London, 14.22-17.09, G.&M., 4, Duke.

G.E.A., "Goliath," F-FHMU, Paris-London, 15.20-18.40, G.&M., 11, Favreau & 1.

APRIL 16th:

K.L.M., Fokker, H-NABH, London-Amsterdam, 10.48-15.22, G., 1, Holmes

M.A., Breguet, F-CMAF, London-Paris, 12.41-15.55, G., 2, Briere.

G.E.A., "Goliath," F-FHMU, London-Paris, 12.45-15.05, G., 13, Favreau & 1.

I.A.L., DH18, G-EARO, Paris-London, 12.00-14.53, Nil, 8, Powell.

M.A., Breguet, F-CMAK, Paris-London, 12.53-16.05, M., 3, Le Men.

M.A., Salmson, F-CMAN, Paris-London, 14.25-18.20, G., Nil, Malfanti.

K.L.M., Fokker, H-NABN, Amsterdam-London, 16.00-19.30, M., Nil, Olley

APRIL 17th:

NIL.

### The Air Port of Cricklewood.

APRIL 11th:

H.P.T., HP O/10, G-EATM, Paris-London, 11.55-15.10, Nil, 5, McIntosh & 1.

APRIL 12th:

H.P.T., HP O/10, G-EATK, London-Paris, 12.15-15.45, G.&M., 10 Wilcockson & 1.

APRIL 13th:

H.P.T., HP O/10, G-EATK, Paris-London, 11.25-14.55, Nil, 9, Wilcockson & 1.

APRIL 14th:

H.P.T., HP O/10, G-EATN, London-Paris, 12.00-14.45, G.&M., 7, Wilcockson & 1.

APRIL 15th:

H.P.T., DH9, G-EAUI, London-Paris, 15.00-17.20, Nil, 1, McIntosh.

H.P.T., HP O/10, G-EATN, Paris-London, 14.05-12.15 (16/4/21), Nil, 8, Wilcockson & 1.

APRIL 16th:

H.P.T., HP O/10, G-EATM, London-Paris, 12.00—, G.&M., 10, Perry & 1

APRIL 17th:

NIL.

### Inland Flying at Cricklewood.

April 11th.—H.P.T., B.E.2e (R.Ae.C. machine on hire) (Faber).

April 12th.—H.P.T., H.P. O/10 test (Wilcockson); D.H.4a test (McIntosh).

April 13th-17th.—Nil.

### Inland Flying at Croydon.

April 11th.—P.L. Westland from Yeovil (Keep).

April 12th.—I.A.L., Westland tests (Barnard); S.F.S., Avro, joy-rides (Muir); M.W.T.C., DH6, test (Lovell).

April 13th.—I.A.L., Westland test (Barnard); L.A.S., DH6, return Leatherhead (Knowles); S.F.S., Avro, joy-rides (Muir).

April 14th.—S.F.S., Avro, joy-rides (Muir).

April 15th.—P.L., Westland, Yeovil, return (Keep).

April 16th.—I.A.L., "Vimy" test (Barnard); L.A.S., Avro and DH6 Leatherhead return and joy-rides (Hayns and Knowles); S.F.S., Avro joy-rides (Muir).

April 17th.—Nil.

### Air Port Statistics.

CONTINENTAL

Machines, 53; Passengers, 179; Crew, 69; Total Personnel, 248.

### The Air Mail.

The Postmaster-General announces that, on and from the 18th inst., in addition to the existing Air Mail Services from London to Paris and to Brussels, there will be a morning Air Mail from London to Amsterdam, leaving Croydon aerodrome at 10.00, serving all parts of Holland, and, by means of the afternoon train from Amsterdam, North and Central Germany, Denmark, Sweden, and Finland; a combined service by ordinary night mail from London to Rotterdam, connecting on the following morning with an Air Mail from Rotterdam to Bremen, Hamburg, and Berlin, which will serve North and Central Germany, Denmark, and some countries east of the Baltic.

The special fee payable, in addition to ordinary foreign postage, on packets posted for transmission by either service will be 4½d. per ounce.

The opening of the air route Hamburg-Copenhagen has been postponed, but air mail letters for Denmark can still obtain an advantage of three to twenty-four hours over the ordinary service, whether sent by the morning Air Mail to Amsterdam or by the combined service via Rotterdam. The latter service will, for the time being, offer no advantage for letters to Sweden and Finland.

The special fee payable, in addition to ordinary foreign postage, on packets posted for transmission by the London-Brussels Air Mail will be 4d. per ounce, instead of 2d. per ounce as hitherto.

Air Mail arrangements may be affected in the event of a serious curtailment of railway and road transport facilities.

### The London Terminal Aerodrome.

During the week the Department of Civil Aviation have been erecting Bessonneaux portable hangars for extra housing in the event of any emergency arising

(*Continued on page 381.*)

# AERONAUTICAL ENGINEERING

## SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

There appears below a fairly full report of the Wilbur Wright Memorial Lecture, given before the Royal Aeronautical Society by Mr. G. I. Taylor. In the absence of printed copies of the lecture itself, this report is based on longhand notes supplemented by memory, and is not therefore verbally accurate. Probably much of the charm of the original has been lost, but the sense has been preserved with, it is believed, considerable accuracy.

To the very large number of those whose knowledge of science is limited, Mr. Taylor's statements as to the difference between researches in applied and in pure science will seem startling. To those who have a very poor opinion of the value of pure science, his views may serve for enlightenment.

To suggest that abstract researches in pure science are a waste of time because it is impossible to predict whither they will lead is rather like suggesting that an attempt to decipher an inscription in an unknown language is useless because one cannot know what the inscription is about.

* * *

Descriptions and illustrations of two very interesting machines are published in this issue. The first of these is a seaplane built for the Dutch Navy for use in the Dutch East Indies (page 376).

The second is a development of German all-metal construction and is a flying boat which is essentially a tractor cantilever monoplane of the standard fuselage type with hydroplaning surfaces on the bottom of the fuselage. There are natural difficulties in the way of giving adequate airscrew clearance, and to overcome these a very curious outline has been given to the machine (page 378).

## THE WILBUR WRIGHT LECTURE.

The annual Wilbur Wright Memorial Lecture of the Royal Aeronautical Society was read at the hall of the Royal Society of Arts on the evening of April 12th. The lecturer was Mr. G. I. Taylor, F.R.S., a mathematical physicist, before the war a Fellow of Trinity College, Cambridge, who served during the war at the Royal Aircraft Factory, learnt to fly, and became an officer of the Royal Air Force. He has since returned to Cambridge and has there engaged in research work. The title of the lecture was "Scientific Methods in Aeronautics."

Whether it was that the title itself led the initiated to expect a deep, learned, and probably dull discourse, or that fears of transport and rail strikes had produced their effect on the attendance, it is an unfortunate fact that this, one of the most interesting and entertaining lectures that one has ever heard, was also one of the most sparsely attended meetings of the Royal Aeronautical Society of recent times.

The chair was taken by Air Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., who briefly introduced the lecturer.

### The Lecture.

**Mr. Taylor** said that in his lecture he proposed to give an outline of some of the scientific methods which had been applied to the solution of the problems of aeronautics, and that for this purpose he would classify aeronautical knowledge in a rough series, starting with problems which related directly to practice, and proceeding down the scale to problems further and further removed from immediate application to the design or use of actual aeroplanes or their equipment.

Thus the starting point would be direct tests on mechanisms to be used in the air—such as actual aeroplanes, engines, machine guns, etc. After this would come such things as bench tests of engines, then model experiments, and finally research work devoted to attempts to discover explanations of the causes of the effects of which the former tests gave measurements only.

### THE AERIAL DART.

As an example of the tests on actual equipment for use in the air he instanced the aerial dart, or "flechette," of French design, which was sent for test to Farnborough. It was intended to be dropped in large numbers from aeroplanes on to troops, and Farnborough was asked to experiment, report as to its value, and the possibility of improving it. The original dart was a pointed steel rod, milled out at its after end to form fins.

The first conclusion arrived at was that a cheaper and better dart could be made by fitting a steel point into a light brass tube, and a number were made. After overcoming minor difficulties in arranging them to fall straight—tested by dropping them down Pyestock Chimney—the question arose as to whether they would produce the penetration claimed by the inventors.

Direct tests were impossible because no volunteers for targets were forthcoming, and there was no certainty of hitting such a target if it had been available. Therefore the resistance was measured and the speed of fall from the contemplated height computed, and tests were made by projecting the darts at this velocity.

### A LEG OF MUTTON AS A SCIENTIFIC INSTRUMENT.

The instrument of projection was a bored out service rifle and a ballistic pendulum was used to measure and adjust the velocity to the required velocity. As the question to be solved was what was the penetration of flesh and bone at given velocities, the weight of the ballistic pendulum was composed of a leg of mutton, and thus one experiment determined both velocity and penetration at that velocity.

### AN AMAZED CAVALRYMAN.

Finally darts were taken up and dropped on the aerodrome to discover the likelihood of their securing hits on troops. The lecturer and Mr. Jones proceeded thereafter to seek out each dart on the ground and mark it with a piece of paper. After this had been done a cavalry officer enquired what he was up to. On learning that he was marking for an aeroplane dropping darts the cavalryman was astonished, and regarding innumerable little squares of paper each transfixed by a dart, remarked that he had no idea that such amazing accuracy was possible.

Actually the tests showed that the darts would not be likely to be effective. They were never used by British pilots—not for this reason, but because it was stated British pilots considered them inhumane weapons. This was a curious effect of the conservatism of pilots. Gunpowder as a method of killing was of respectable antiquity, the bomb was suspect, but admitted because of its included, and respectable, explosive, but the dart which used gravity alone was not a respectable weapon.

### THE VALIDITY OF MODEL TESTS.

Coming now to the question of tests on models, Mr. Taylor said the essential question was how far models could really represent facts. This involved the theory of dynamic similarity and the difficulty arose from the fact that there were factors leading to changes in force which we could not control. If there were more than three independent causes tending to change the forces acting on a model the model could not accurately represent the full size object.

Generally there were more than three such causes, and the art of the use of model experiments lay in correctly deciding which forces were of least importance, and securing similarity in the others.

### Model Yachting as a Scientific Pursuit.

As a sample he instanced a model, on a scale of 1 in. to the foot, of a 24-ft. yacht. Theory showed that for similarity between the two model and full size yacht should be tested in winds whose speeds were as the square root of the scale, and that the sailing speeds would be in the same ratio. Thus a fresh sea breeze would be about 25 m.p.h., and the wind speed for the model to simulate this condition should be about 7 m.p.h. The full-size boat in a 25-mile breeze would make about 7 m.p.h., and the model ought, with the 7-mile breeze, to make about 2 m.p.h. Now it so happened, by accident, that a fresh breeze measured 1 ft. above the surface of an inland pond gave a speed of about 7 m.p.h.

Anybody who knew the Round Pond in Kensington Gardens would know that in such a breeze a good 24 in. model sailed across the pond at such a speed that one just had time to walk round and meet it. As man walked about 3 m.p.h., and the way round the pond was one and a half times as far as the distance across, it was evident that the speed of the model was about 2 m.p.h. Therefore the model gave useful data as to the full size boat.

### The Difficulty of Securing Strict Similarity.

An instance of an application of the theory to mere aeronautical purposes, he instanced tests on a pilot bomb. Early in the war several people had the idea that bombs would do more damage if they exploded at an appreciable distance from the ground. Therefore many elaborate schemes for dropping a bomb which was preceded by a pilot bomb were devised The pilot bomb was attached to the main bomb by a wire and hit the ground ahead of it, and its impact was to cause the explosion of the main bomb.

Unfortunately none of the inventors were clear as to how the pilot bomb was to pull the connecting wire and still keep ahead of its larger and heavier companion, and the matter was referred to Farnborough. The obvious solution was to slow up the main bomb by adding resistance, but the speed could not be reduced below 500 ft. per sec., otherwise there would be no accuracy of aim possible. But at 500 ft. per sec. it would not be possible to see the bombs falling and to discover whether the pilot kept ahead or not.

It was therefore decided to use a bomb with a parachute which would fall at only 100 ft. per second—which was in effect making a model experiment. But under these conditions the maintenance of strict dynamic similarity required the pilot bomb to be very small—so small that even at 100 ft. per sec. it would be invisible. A few experiments with pilots of more visible size sufficed to prove that an absence of this condition did not seriously affect the results, and the experiments were carried out to a satisfactory conclusion. The pilot bomb, however, did not come into use.

In practice nearly all model experiments had to be carried out under conditions which gave no grounds for believing that strict similarity was attainable. Nevertheless in many cases they were reasonably accurate for predicting results. They gave no information as to the reason for those results.

### Dr. Bryan's Contribution to Aeronautics.

The greatest scientific advance in aeronautics had been due to Bryan, who treated the aeroplane mathematically as a rigid body and obtained the equations of motion. He then made certain assumptions as to wind forces on surfaces, and obtained certain results as to the stability of aeroplanes. His assumptions and, therefore, his conclusions, were incorrect, but when his assumptions had been corrected as a result of experiment, his mathematical methods gave results very closely in accord with facts.

At one time at the R.A.E. it became necessary to carry a circular weight of streamline section suspended below an aeroplane. To steady it they had fitted a fin to it, this fin being of such a size that the weight, when suspended, pointed into the wind, weathercockwise. When they flew with it it was horribly unstable, wobbling from side to side in an appalling manner. Increasing the fin made it no better.

The lecturer had therefore applied to the case Prof. Bryan's equations and had arrived at the result that such oscillations occurred only with too large a fin. Careful paring down of the fin led to reaching a stable condition. Further paring showed that this stability occurred within such a very small range that trial and error methods alone would probably have failed to reveal it.

### Pure Science and Golf

Illustrating the importance of purely scientific research, Mr. Taylor said he would take an extreme case and imagine the existence of a whole race of men who gave their whole time to golf, who played golf, talked golf, thought golf, and dreamt golf to the exclusion of all else. In process of years such a race would probably develop a class of very able technicians, who would invent improved balls, and wonderful clubs, and design fixtures to keep the eye fixed on the ball, and who by the like processes might be able eventually to put up the length of drive from the present 200 yards to, say, 300 yards. That would be about as much as could be hoped.

But suppose there were also a race of maniacs who spent all their time on the study of physiology, the effects of nutriment, and heredity, and such things. These latter would learn very little about golf, but they might eventually learn so much about man that they were able to breed super-golfers, possessed of muscles and of an anatomy, specially adapted to the work of driving balls, and they might thus entirely revolutionise golf.

### Science, Technique, and Transport.

Again, supposing there had been a Minister of Transport 180 years ago. He would not have been able to do anything towards the provision of Tube railways. All his time would have been occupied in decreeing the height and position of port and starboard lights on horses and in legislating for their licensing and registration. An H. G. Wells of that day would not have been able to see further into the future than to predict that if traffic continued to increase in another 150 years there would not be room for it on earth.

The men who made electric traction possible were Oersted and Faraday, whose investigation of the properties of the electric current laid the foundation of electrical engineering, but who never dreamt of the results to which their work would lead.

Far-reaching discoveries which led eventually to revolutionary changes in applied science nearly always came from men who were not concerned with that application. He thought that if those who had laid the foundations of modern transport had known what they were doing they would have been horrified. After all it was ridiculous to make it easy to reach China—for if you did the effect was that when you got there you found it full of Englishmen, and, therefore, the less worth visiting.

### The Extent of the Field of Pure Science.

Pure science was a subject of enormous extent, and the range of activities of the pure scientist was very wide. Instance such a man as Lord Rayleigh, whose work has affected the applied sciences of electricity, chemistry, optics, astronomy, heat, hydraulics, aeronautics, and others. This was because, firstly, quite a number of applied sciences apparently distinct, were based on one foundation, and, secondly, because in pure science one could never know where a given line of enquiry would lead.

Therefore if a pure scientist set himself a definite goal he might find that he could never reach it. If when he reached an insuperable difficulty on his way he turned off that path in another direction, his result might be widely dissimilar from the result he started to achieve. It might be quite as useful.

### The Science of Hydrodynamics.

It was fairly well known that there was a science of hydrodynamics which had reached a high degree of development. This science dealt with an ideal fluid, devoid of viscosity or stickiness, and the science indicated that in such a fluid no force was exerted on a body immersed in the fluid by movement of the fluid past the body.

Everybody knew that in an actual fluid there were forces acting on a body when the fluid moved past it, and this discrepancy was due to the fact that turbulence was set up in the fluid round the body, and that this turbulence had to do with the viscosity of the real fluid.

Attempts to investigate the turbulence of a fluid under real conditions by mathematical means had failed, even in the simplest cases, and until we could investigate and explain these simple cases we could not hope to explain the complex ones of aeronautics.

### The Curious Results of an Aerodynamic Investigation.

He had himself attempted to investigate cases of turbulence of the air. He had considered the turbulence of wind over the earth. In the course of his investigations he had established a relation between certain apparently isolated facts, amongst others the temperature range of the atmosphere at the top of the Eiffel Tower and the variations in the height of the fog-banks off Newfoundland. The same investigations led to the conclusion that the dissipation of energy by the tides of the sea was greater than had been believed. From this later conclusion of his another scientist had recomputed the effect of the tide as a brake on the earth's rotation, and this computation agreed with astronomical observations—not before explained—as to the rate at which the earth's rotation was slowing.

Thus attacking an aerodynamic problem he had provided the sciences of meteorology and astronomy with new data of some considerable importance.

### A New Line of Inquiry and Some Curious Results.

He had abandoned the attack on turbulent motion of a fluid and had instead considered the conditions of a fluid which was rotating as a possible approach to the solution of

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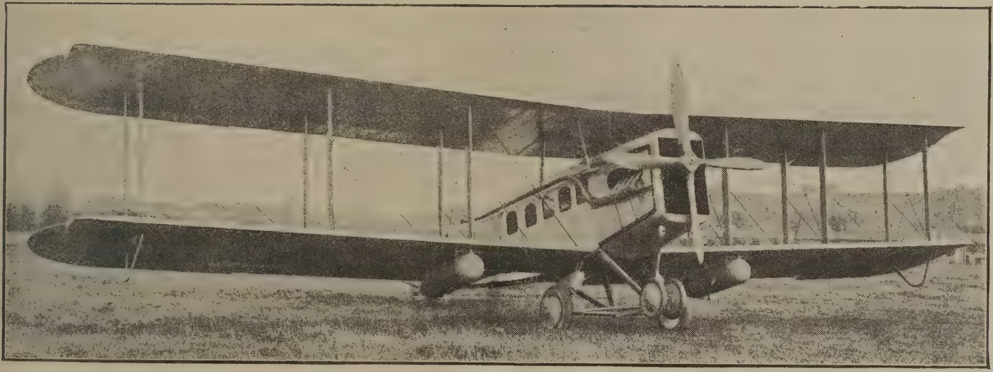

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| 2. | **Westland Rolls-Royce Limousine** - | Capacity: 3 passengers and light luggage. |
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Travellers by Air demand the **Best**, the most **Reliable** and the most **Comfortable** machines. **The Air Ministry Competition** ***has proved*** that **we** have them.

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the problem. He had discovered motion in such a fluid to be more amenable to treatment. He had been able to predict certain effects under these conditions and to verify them experimentally.

For instance he predicted that if a cylinder were pulled along a trough full of fluid while the trough and fluid were rotating that the cylinder would move straight along the centre of the trough. But if for the cylinder a sphere was substituted that sphere would be deflected sideways in its movement. Experiment showed that this was so.

Another result predicted was that a sphere immersed in a rotating fluid would be surrounded by a sheath of fluid which would not rotate and there would be no tendency for the sphere to be turned with the fluid, that is to say that the rotating fluid would exert no force on the body. That this occurred in fact was then demonstrated by an experiment in a vessel of rotating water.

Thus one condition wherein an actual fluid behaves exactly like the ideal fluid of classical hydrodynamics is established.

[Presumably Mr. Taylor does not yet know to what result these investigations will lead him eventually, but they certainly do seem to hold out hopes of leading to some more complete solution of the problems of fluid motion.—Ed.]

### THE DIFFERENCE BETWEEN PURE RESEARCH AND APPLIED SCIENCE.

A very great difference existed between such scientific research work and the testing work of an aerodynamical laboratory. The N.P.L., for instance, had a splendid equipment and exceedingly able personnel. They used the same instruments and the same kind of brains as were needed for pure research, and it was very difficult to persuade the politician, or even the engineer, that there was a vast difference in work of the two kinds.

But the work of the N.P.L. was that of measuring certain forces. They knew beforehand the kind of answer they would get, and in many cases it would be possible to write the reports of their work before making the experiment, just leaving space for the figures to be obtained by test.

With experience they could estimate the number of man hours required to carry out a given test, and many of the tests could be carried out by any tester who happened to be available. They could say that working hours were from 9 to 5 and that so many men should be able to obtain so many results per annum.

The pure scientist was in an altogether different case. He not only did not know the form of the answer he was likely to obtain, he did not even know what question he was going to get an answer to. He might obtain important results at once, he might never obtain them. He might work for weeks and see no light ahead, to wake up in the midst of the night with the solution of a problem of vast importance. He might work day and night and grow more and more confused by the results of his experiments, yet a chance incident or word, seen or heard, on a holiday might give him the key to his difficulty.

If the pure scientist attempts to fix his attention on the solution of one specified problem, it is quite likely that he will fail of that solution. If he allows himself to explore the avenues that his investigations open to him he is likely to reach results widely different from those he started to seek.

Therefore the work of the pure scientist is incompatible with that of an institution devoted to obtaining specific measurements in an applied science.

**Air Commodore Brooke-Popham** said that as it was not customary to discuss lectures such as this his duties were confined to moving a vote of thanks to the lecturer. He had come to the lecture with a mind full of foreboding as to strikes and other unpleasant affairs, but for the 80 minutes of Mr. Taylor's fascinating paper he had had no thought of anything outside the paper itself.

## THE ROYAL AERONAUTICAL SOCIETY.

The new rules for the election of Fellows and Associate Fellows to the Royal Aeronautical Society, approved at the last annual general meeting, have now been published. The main provisions are as follows:—

FELLOWSHIP.—Fellowship is regarded as the highest technical distinction in aeronautics. It is confined to those who in addition to having qualified for Associate Fellowship have made valuable contributions to the Science of Aeronautics by: (1) Practical flying, whether as pilot, engineer or navigator; (2) Aeronautical engineering, design, practical construction or administration; (3) Application of special branches of science, mathematics or engineering to aeronautics; or (4) The development of the theory of aeronautics.

Candidates must be qualified for Associate Fellowship, though they need not necessarily have been elected as such. No person shall be eligible for Fellowship until he has attained the age of 28 years. Candidates must have been engaged in the science or practice of aeronautics for at least five years, two of which must have been in a position of primary responsibility.

Fellowship is reserved for those who have reached a position of very high standing in the Science of Aeronautics and are elected by the Council to this Grade of the Society.

ASSOCIATE FELLOWSHIP.—The necessary qualifications for Associate Fellowship are divided into three heads:—(a) General Education; (b) General Technical Qualifications; and (c) Aeronautical Qualifications

(a) The qualification in General Education shall be matriculation at a university or the holding of a school certificate of the "First examination," recognised by the School Examinations Board, or an approved equivalent examination or status.

(b) The General Technical Qualification is to cover either: (1) engineering, (2) science, or (3) mathematics—

(1) The engineering qualification shall be the holding of an approved engineering degree or certificate in engineering of a college or university. The general standard shall be that of the Institution of Civil Engineers for Associate Membership.

(2) The science qualification shall be the holding of an approved science degree or diploma in chemical or physical science.

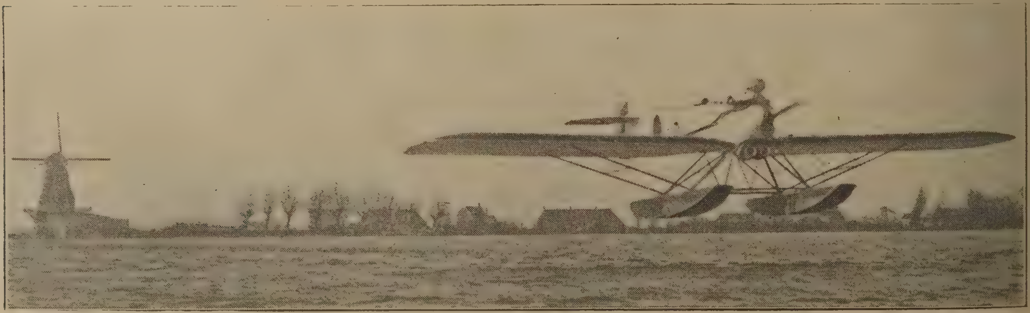
(3) The mathematical qqualification shall be the holding of an approved mathematical degree or diploma.

(c) The candidate shall also be required to pass an examination in a specified list of subjects relating to aeronautical engineering. The standard shall be such as might reasonably be expected to qualify for a degree in aeronautical engineering if established.

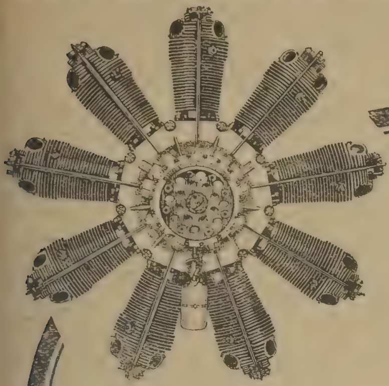
Two years' experience in the application of the science of aeronautics is also deemed essential. No person shall be eligible for Associate Fellowship unless he has attained the age of 23 years at the date of application, though the Society's examination may be taken at any age over 21. The Council reserve the right of admitting to Associate Fellowship without examination persons with very exceptional qualifications or achievements.

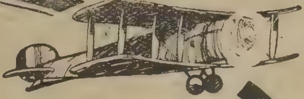
GENERAL.—Every Fellow and Associate Fellow shall, within twelve months of election, submit an original thesis on an aeronautical subject or the application of another science to aeronautics or shall make a suitable donation to the library. These papers will, at the discretion of Council, be delivered as lectures, published in the Journal or Transactions, or filed in the library of the Society.

Complete regulations as to the subjects of examination, entry fees thereto and similar matters have been prepared, and can be obtained from the Secretary, The Royal Aeronautical Society, 7, Albemarle Street, London, W.1.



**The Van Berkel's Seaplane (360-h.p. Rolls-Royce Engine) taking off. Note the ancient example of applied aerodynamics at the extreme left of the picture.**





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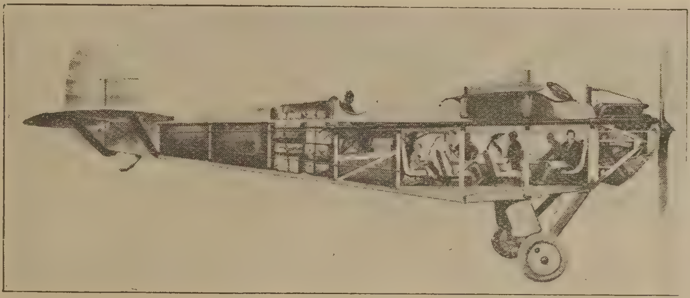

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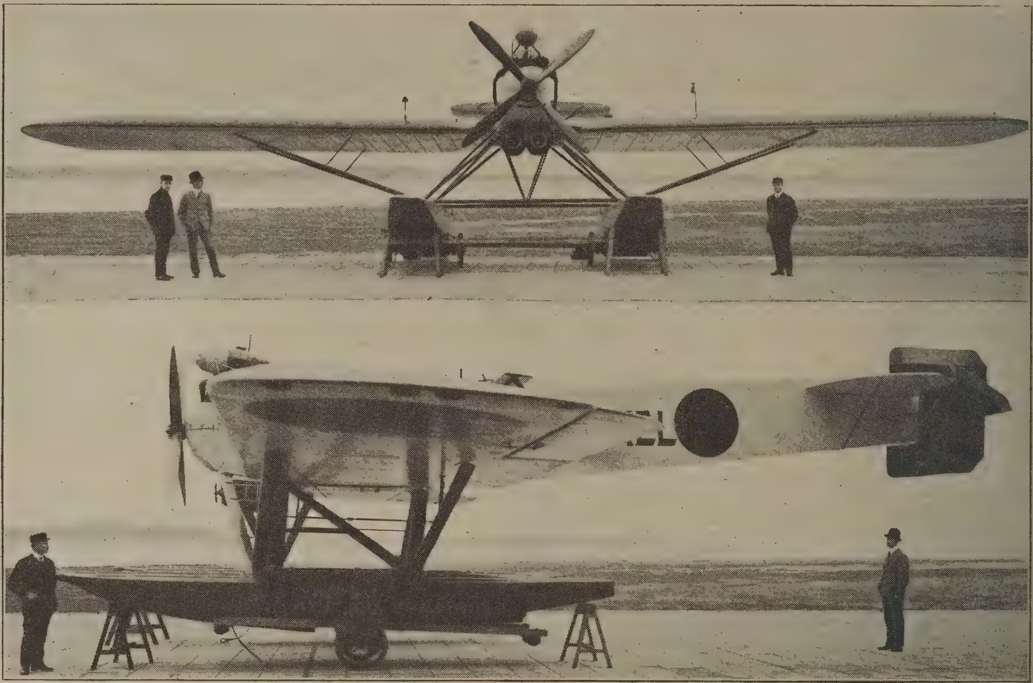
# A DUTCH SEAPLANE.



**Front and Side Views of the new Van Berkel's Seaplane, built for the Royal Dutch Navy for service in the East Indies. The machine is obviously of "Bradenburg" type, but is fitted with a British Engine (Rolls) and with French radiators (Lamblin).**

Some months ago this paper made reference to a new type of seaplane which was being built by the firm Van Berkel's Patent, of Rotterdam, for the Royal Dutch Navy. It is now possible to describe and illustrate this very interesting machine.

Van Berkel's Patent are the manufacturers of the very ingenious bacon slicing machine which ornaments large numbers of the grocers' shops of this country, and they began the building of aircraft for the Dutch Government during the war. So far as is known their products were almost exclusively based on the German Brandenburg designs, and the photographs here reproduced show that Brandenburg influence remains very strong.

The new machines have been designed for service in the Dutch East Indies, and the requirements for the particular service are distinctly severe. Generally the requirements are those for long distance reconnaissance, carrying machine guns and camera gear, and in particular the machines were required to resist the ravages of the extremely warm and damp atmosphere of the Dutch Colonies.

The machines are twin-float rigidly braced monoplane two-seaters, fitted with Rolls-Royce "Eagle VIII" engines of the low compression type, fitted with the most recent type of reduction gear.

The floats are constructed entirely of duralumin and are fitted with three steps. Seven watertight compartments, each with a hand-hole, are fitted. The floats are of such length and size that the tail is kept always out of the water, and are spaced so far apart as to render unnecessary any wing-tip floats.

The floats are coupled together by one pair of heavy steel tubes, and support the fuselage by an undercarriage which in end view consists of two M's and in side view of two N's. In addition a pair of extra struts runs from the front float attachment to the front of the engine emplacement.

In addition to the undercarriage struts there are on each side two lift tubes running outwards to the wing spars. These tubes are stiffened by the provision of short tubes running from the middle of the struts to the spars above. These lift tubes are cross braced by diagonal cables, which serve as "incidence" wires and also to duplicate the lift tubes.

The fuselage is of the three-ply covered type, built on four longerons and 18 transverse bulkheads, is rectangular in cross section, tapers to a vertical knife edge aft, and rises appreciably to the rear.

The wings are attached to the lower fuselage longerons. They are built up from two very strong boxspars of spruce with three-ply webs reinforced by packing pieces where drilled for bolts and at the points where there are compression tubes. These spars are glued and screwed together and bound with phosphor-bronze wire at regular intervals. There are no forgings, all metal parts being made from mild-steel plates welded together, but at no point is there any welded joint in tension. All metal wing parts are cheap to manufacture, of light weight and very strong.

The wing section of the Van Berkel seaplane is rather thick; the bottom surface is nearly flat. The lift-drift ratio of this section is claimed to be very high. There is a slight positive angle of incidence at top speed.

The ailerons are fitted to a false spar aft the rear spar, and are hinged at the upper wing surface. A short lever projects downwards from the ailerons and is coupled by a tube to a second short lever pivoted on the rear spar, which in its turn is operated by the control cables. It can be seen in the lower photograph that there is very little of this operating gear in the open. The ailerons are balanced by auxiliary surfaces carried above and in advance of the hinges.

The aileron control cables are so arranged that each aileron is separately controlled, and the failure of any one aileron cable or lever can put only one aileron out of action.

The tail unit consists of tail plane, elevators and rudder, there being no fin. The tail plane is built on steel tube spars and is three-ply covered; elevators and rudder are fabric covered.

The elevators are built on a through-going front spar of steel tube with the control lever in the centre and within the fuselage. Both elevators and rudder are balanced.

Pilot and passenger are seated in tandem, the pilot ahead. The main petrol tanks are made to form the pilot's seat, one large lower tank forming the seat, and a smaller one placed on top of the first serving as a back. The upholstery consist of a Heinicke parachute pack.

The passenger's seat is mounted upon a pair of runners and can be slid along these fore and aft. A complete dual control is fitted forward, and is so arranged that the control lever and rudder bar may be disconnected and removed, even in flight, without interfering with the pilot's control. By sliding his seat aft the observer attains a position more convenient for the use of his guns, camera, or navigation instruments, and presumably thus is enabled to see down aft of the

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trailing edge. The second seat is also equipped with a Heinecke parachute, and it is pointed out that the absence of any top bracing renders the machine a particularly easy one to leave with a parachute.

The engine mounting consists of two strong ash bearers carried by three transverse bulkheads. Over the engine, carried on a steel tube cabane, is a large streamline tank, divided into three parts, serving as a water header tank, and steam separater, and as a gravity petrol tank. Between water tank and petrol tank is an air filled compartment serving to insulate the petrol from the hot water, and as an insurance against leakage between water and petrol spaces. This space is drained by a long pipe discharging below the fuselage.

Petrol passes from the main tanks to a five-way distributing chamber. One wind driven and one hand petrol pump are fitted, and either pump may be used to feed petrol from either tank to the gravity tank. Petrol may also be pumped direct from the hand pump to the engine.

An oil reservoir is fitted to the nose of the fuselage under the reduction gear. This tank also serves as an oil cooler. The oil returned from the engine flows down between the front wall of the tank, and an inner wall, and is cooled by the aircooled exterior before passing round to join the bulk of the oil behind the inner wall of the tank.

Two Lamblin radiators are carried below the engine.

The machine is fitted with wireless, and is electrically lighted for night flying, and has an electric signalling lamp system for intercommunication between the crew.

A very complete set of instruments is fitted, including a "Drexler" gyroscopic turn indicator, and the machines carry as part of their equipment anchors, fire extinguishers, parachutes, Verey pistols and camera housings, in addition to machine guns and such warlike items.

Very careful tests have been made of the type by the Dutch authorities before the machines were accepted, the first of the type having been sand loaded to six times flying load, and to three times up-side-down flying load, and exhaustive flying tests were made of a second machine.

It is reported that the machine is stable, easily controllable and comfortable to fly, and quick at leaving the water. The main dimensions and particulars are given below.

SPECIFICATION OF THE VAN BERKEL'S SEAPLANE.

| | | | |
|---|---|---|---|
| Span | 62 ft. | Max. speed, sea level | 112 m.p.h. |
| Overall length | 44 ft. 6 in. | Min. speed | 50 m.p.h. |
| Overall height | 14 ft. 6 in. | Climb to 6,800 ft. | 17 min. |
| Load— | | Ceiling | 12,000 ft. |
| Fuel | 1,170 lb. | Fuel capacity | 172 gall. |
| Crew and equipment | 930 lb. | Range (full power) | 7½ hr. (850 miles). |
| Engine | Rolls-Royce "Eagle VIII," 350 h.p. | Range (cruising) | 10 hr. (940 miles). |

## A CURIOUS WATERPLANE.

The very curious-looking machine illustrated in the accompanying photographs is the latest of the Zeppelin-Dornier flying-boats, known as the "Do CsII 1920." This machine is a development of the "Do CsI" type which has become fairly well-known through the employment of one specimen by the Swiss "Ad Astra" joy-riding concern, and may be considered as a hybrid between this type of boat and an ordinary tractor monoplane. A comparison with the Do C3 land-going monoplane described in the issue of April 6th shows many points of resemblance in the two designs.

The body may be regarded as either a boat built up to fulfil the functions of a tractor type fuselage, or as the fuselage of such a machine as the Do C3, fitted with a hydroplane bottom.

The wings are in one piece, attached to the top of this boat fuselage, and below is situated a passenger cabin, exactly as in the land machine and, like it, fitted for six passengers. The wings themselves are identical with those of the already described land machine, and so are the tail organs.

In place of the projecting supports carrying landing wheels there are now very much larger projections, serving as lateral floats on the water and as lifting surfaces in the air, and the lift tubes which run up to the wings are carried from these projections, instead of from the body itself.

In the water machine the engine has been raised very considerably as compared to its position in the land machine, and, instead of the pilot having his seat aft of the cabin, he is interposed between the cabin and the engine. In order to give to him some sort of a view past the engine, which projects high above his head, the engine casing has been narrowed down in a manner clearly shown in the photographs.

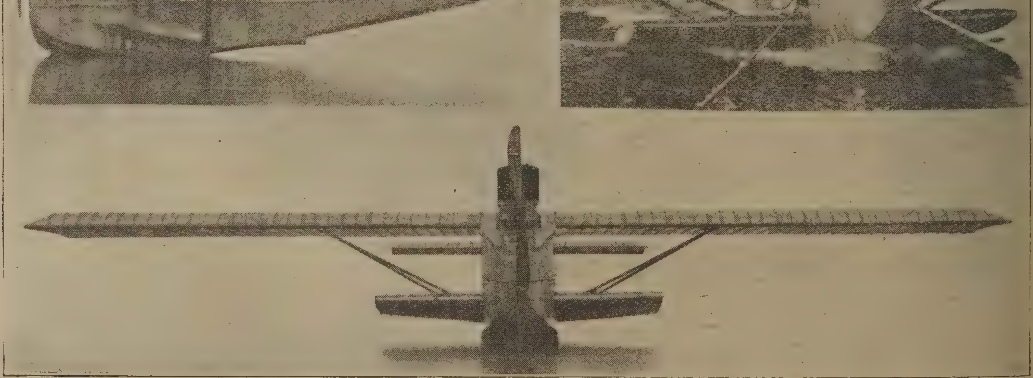
Generally speaking, the construction of the machine follows exactly that of the Do C3 already described. High-tensile steel is used for spars, struts and other heavily stressed members and duralumin serves for covering and for lightly loaded members.

It is stated that one of these machines has been delivered to the Ad Astra Company but suffered an accident on a test flight. It is to be hoped that it will be repaired, as it will be extremely interesting to discover how this very ingenious effort to build a flying-boat of the tractor fuselage type behaves in service.

The main particulars of the machine are given below :—

SPECIFICATION OF THE ZEPPELIN DORNIER DO CS.II.

| | | | |
|---|---|---|---|
| Span | 17.00 m. | Weight loaded | 2,000 kg. |
| Chord | 3.00 m. | Loading | 42.9 kg. per sq. m. |
| Length overall | 10.25 m. | Power loading | 10.8 kg. per h.p. |
| Height overall | 2.75 m. | | |
| Wing area | 47 sq. m. | Fuel capacity | 3 hr. |
| Engine | B.M.W.IIIa, 185-h.p. | Speed (max.) | 150 km.p.h. |
| | | Speed (cruising) | 120 km.p.h. |
| Weight empty | 1,350 kg. | Ceiling | 4,000 m. |



A FUSELAGE MONOPLANE AT SEA.—Three photographs of the curious Dornier single-engined flying boat described above.

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**THE NEW WESTLAND SIX-SEATER.** The photograph shows the six-seater Westland (Napier Engine) which has just been delivered to the Department of Civil Aviation. Generally of the same type as the machine which did so well in the Air Ministry Competitions, this model has been modified in certain details and is specially fitted for experimental night flying. It is described on this page.

## A NEW WESTLAND PASSENGER CARRIER.

The machine illustrated is a new Westland limousine built to the order of the British Air Ministry which has just undergone makers' tests at Yeovil, and has recently been delivered at Croydon Aerodrome. It is nuderstood that it is to be used at least in part for experimental night flying on the London-Paris route.

The machine is a modification of the six-seater Westland which did so well in the Air Ministry Competition for Commercial Aircraft last summer.

The modifications made are as follows :—

The lateral control has been simplified, the ailerons being operated from the cables through bell crank levers fitted in the bottom plane. These cables do not pass over any pulleys, and thus fraying is entirely avoided—a very important point from considerations both of safety and of cost.

The petrol system has been changed and the carburetters are now fed by a pressure system instead of by petrol pump.

The landing wheels have been increased in size to 900 by 200, and the brake drums are now built into the wheels instead of being separate units attached to the wheels, as in the original machine. The brake gear generally has been strengthened up and made much more powerful than in the first example. A complete electric lighting system is fitted to the cabin, and the machine is wired for night flying.

The cabin is fitted as before for five passengers; the engine remains a Napier "Lion." The airworthiness certificate load is 150 lb. greater than that of the first machine of the type, the total permissible weight now being 6,000 lb., which corresponds to 1,200 lb. of disposable load.

Petrol tanks, which are as before entirely without the fuselage, the two main slung under the lower wing and the gravity-tank in the centre section, have a capacity of 99 gallons, giving the machine fuel for 5½ hours' flight at cruising speed.

## THE LICENSING OF CIVIL AERIAL NAVIGATORS.

Under the above title, His Majesty's Stationery Office have published a pamphlet of 16 pages giving, firstly, an extract from the International Air Convention which provides for the licensing of the navigators of aircraft used for public transport, and thereafter a fairly full statement of the grades of aerial navigators' certificates which are provided for in the British regulations, the limits of availability of the various grades, the qualifications required of the candidates and the examinations which must be passed before such licences are granted, etc.

The pamphlet, which bears the identification mark C.A. Publication 2, can be purchased through any bookseller to order, or directly through any of the branches of H.M. Stationery Office, price 3d., and should be in the hands of all those who propose to become qualified as aerial navigators.

Not being oneself qualified in the mysteries of the art of navigation one can offer little comment as to the technical side of the regulations, but it seems to be indicated that very few, if any, of the pilots at present conducting machines on the Paris-London route are qualified to navigate upon that route.

## ON WIND TUNNEL DISCREPANCIES.

M. A Toussaint, of the French Section Technique, has recently undertaken a comparison of all the available authoritative tests on the resistance of cylindrical bodies in wind tunnels. These tests include N.P.L., East London College, The Eiffel Laboratory, St. Cyr Laboratory, and Göttingen tests, and cover wires and cylinders ranging in diameter from 1 mm. up to 50 mm. of varying length to diameter ratio, at wind speeds varying from 4.6 to 20 metres per sec.

Setting out the whole of these results upon a uniform basis, M. Toussaint shows clearly that although the majority of these results agree as to the kind of law governing the relations between resistance, air speed, and dimensions of the body concerned, there are very important divergences between the numerical values of the resistance coefficients and of the critical speed dimension factors arrived at in various wind tunnels.

While M. Toussaint suggests that these differences are probably due to varying degrees of turbulence in the air streams of various wind tunnels he very properly points out that until these divergences are satisfactorily accounted for it is not possible to regard wind tunnel results as a satisfactory basis for establishing aerodynamic laws.

Incidentally it is of interest to note that the American National Advisory Committee's Report No. 43, which is a translation of M. Toussaint's original note, seems to be the first account of this rather important research to appear in this country.

## ENGINES FOR AIR LINES.

The following letter has been received :—

Sir,—We would call your attention to an advertisement of an engine firm in this week's issue of THE AEROPLANE in which they state that all the aeroplanes used on the London-to-Paris Air Service are fitted with their type of engine

This statement is apparently made on the strength of an article appearing in the Times of March 18th, 1921, which states that the Vickers-Vimy D.H.9, D.H.19s, and Handley Page aeroplanes are being used on the service.

As is well known, there is no such machine as D.H.19, and this is obviously an error for D.H.18, which is fitted with a single 450-h.p. Napier Aero Engine. You will realise that such a statement in this firm's advertisement is very damaging to us, bearing in mind the fact that the Airco 18 machines fitted with Napier engines are the most satisfactory and economical employed on the service.

As you know, the 450-h.p. Napier Aero Engine is the only single engine which could lift a D.H.18 machine which carries eight passengers in addition to luggage and pilot. It might also be recalled that this engine further proved its reliability, economy, and power in open competition, as the machines which secured the highest prize in each class of the Air Ministry Competitions were fitted with Napier engines.

We should be obliged if you would kindly correct the misleading statement which has appeared.—Yours truly,

April 14th, 1921. F. H. JONES, Advt. Manager.

# TRADE NOTES.

## A Seaplane Builder's Labour Trobles.

According to the *Morning Post* of April 15th, the works of S. E. Saunders and Co., Ltd., Cowes, were closed down on Saturday, April 9th, owing to difficulties with the local Trade Unions. They were reopened on Thursday, April 14th, as a non-union establishment at the same rates of pay as previously in force, with the prospect that a profit-sharing scheme will be introduced as soon as possible.

All the foremen have remained loyal to the firm, and some 40 per cent. of the men reported for work on reopening. The remaining employees have been given a period of grace for resuming work, and thereafter the places of those who do not return will be filled from without.

It is said that applications for employment by skilled workers have been received by the firm from all parts of the country.

## COMPANY NOTICES.

### Mortgages, Charges and Satisfactions.

NAVARRO-WELLESLEY AVIATION, LTD.—Satisfaction to the extent of £2,800 on March 14th, 1921, of mortgage dated Sept. 13th, 1920, securing £10,000.

(Continued from page 370.)

On Tuesday evening there was a very cheery gathering of remobilised officers of the Royal Air Force, who came over from Kenley primarily to have a look at the Fokker monoplane. Mrs. Middleton was working the Trust House at high pressure for an hour or so.

The "Goliaths" are still carrying heavy loads of passengers and they at least are showing other firms that it is possible and advisable always to get clear of the ground at the advertised time of departure. Their time for the London-Paris journey has also been quickened recently. One is told that this is due to more power being obtained from an improved type of engine and a more efficient airscrew.

### THE INSTONE AIR LINE.

The D.H.18s have monopolised the service during the week and have been running fully loaded with passengers, goods and mail in spite of the "tartan plaid" weather. Messrs. Chattaway and Powell have been the pilots.

Mr. Keep brought the Napier Westland to Croydon on Monday. Mr. Barnard flew it during the week on test.

*A propos* Mr. Keep, one wonders whether the Westland Aircraft Company Ltd. are experimenting with high-lift wings. It would seem that having a pilot of Mr. Keep's *avoirdupois* would be a direct incentive towards the production of such.

The "Vimy" has been spring-cleaned during the week and has now been painted Royal blue, similar to the "Bat." It is understood that all the I.A.L. machines will be painted the same colour. The "Vimy" was taken for a test by Mr. Barnard on Saturday.

### THE SURREY FLYING SERVICES.

Mr. Muir has been out almost daily with the red-nosed Avro, carrying passengers. In the event of a strike, he has a contract to carry newspapers to York. Owing to Mr. Grant, who acts as ground engineer, and his second pilot Mr. Haydon having had to rejoin the R.A.F., Mr. Muir is working single-handed. He has the second machine back from Birmingham.

Mr. Grant, one understands, is merely teaching men who have done so for years to form fours.

### THE LEATHERHEAD AVIATION SERVICES.

On Saturday Mrs. Chapman came over from Leatherhead with Mr. Knowles in the D.H.6, and Mr. Chapman came in the Avro with Mr. Hayns, celebrating his arrival by a few stunts.

The Avro now has the nose painted Oxford blue and looks very smart. Both machines were carrying passengers during the day.

### THE FLYING DUTCHMEN.

The first "Puma"-engined Fokker arrived at Croydon on Tuesday piloted by Mr. Olley, late of Handley Page Transport Ltd. The service opened officially on Thursday, Mr. Olley leaving for Amsterdam at 10.15 hrs. The incoming machine left Amsterdam at 14.00 and arrived at Croydon about 18.00 hrs.—or just in time. Mr. Hinchcliffe was the pilot, and he showed the machine off in the air, doing some sharp turns before landing.

The machine has a wonderful glide and floated halfway across the aerodrome before touching the ground.

Mr. Leverton, for K.L.M., entertained the visitors to one of Mrs. Middleton's excellent teas, while waiting for the machine, and its arrival was duly celebrated after the approved manner of opening and closing air lines.

One learns that at Amsterdam, the opening of the line was performed by the Prince Consort, who pulled away silver-mounted "chocks" from the front of the wheels and duly declared the route open. They do some things far more picturesquely in Holland than in England.

Mr. Cyril Holmes brought another machine over on Friday and returned on Saturday, and Mr. Duke arrived on Saturday morning, having landed over-night at Lympne. It is rumoured that Mr. Duke is shortly to be roped, thrown and sheared for the revenue to be obtained from his magnificent fleece.

*A propos* nothing in particular one was always rather under the impression that "Struwel Peter" came from Germany and not from Holland.

The K.L.M. will for the present run one machine in each direction daily. The out-going one leaves Croydon at 10.00 hrs., arriving at Amsterdam (after landing at Rotterdam *en route*) about 13.30. The incoming machine leaves Amsterdam at 14.00 and arrives at Croydon about 17.30. The times are arranged to connect with the trains to and from Berlin.

All the pilots state that the machines are delightful to fly, and the passengers' saloon is certainly the most luxurious thing in that line which one has seen. But one would like to see something in the way of an emergency exit in case of a descent in the Channel.

As the wing-tips of the Fokker are some nine feet from the ground considerable difficulty is found in discovering men to hold onto the wings when taxying in a wind.

Due acknowledgment must be made to Holland for designing Mr. Fritz Koolhoven, who doubtless looks after this important function at Amsterdam. As there is every probability of increase of work in this direction it is probable that replicas of Mr. Koolhoven will be put into production at once. It was noticed that the only person who came anywhere near the level of the wing at Croydon was General Festing, so probably he will take shifts with Mr. C. R. Fairey and M. Leon Morton: and perhaps Mr. Pemberton-Billing, when he returns from America, will be permanently employed for the purpose here.—G. D.

## The Berkshire Aviation Co.

### TWO YEARS' WORK.

This month the Berkshire Aviation Co. of East Hanney, Wantage, celebrates its second anniversary. During the last two years of continuous flying in winter and summer some 18,000 passengers have been carried without mishap by four Avro machines from fifty different towns in Great Britain. At a rough estimate some 100,000 miles have been flown, excluding cross-country flights from one town to another.

Free flights have been given by arrangement with 18 newspapers, in various parts of the country, and a great number for the *Daily News* during 1919.

The proprietors of the firm very rightly contend that, apart from turning an honest penny, they are proving in a practical manner to the British public that aviation is an all-weather commercial proposition. The Berks Aviation Co. is run entirely by ex-service people, the proprietors being Messrs. J. D. V. Holmes and J. C. C. Taylor, late Lieuts. R.F.C.

Needless to say one wishes every success to this very sportsmanlike pair and one congratulates them on the energy and pertinacity they have shown. One hopes that in due time they may become the proprietors of one of the great "town-to-town" air transport firms which must eventually cover Great Britain with a net-work of air routes.—C. G. G.

## Brooklands.

The Vickers works are fairly busy and the "Viking IV." may be expected out on test within a few weeks. One understands that some interesting new machines have recently been designed by Mr. Rex Pierson and his staff, and more information may be forthcoming later with regard to these.

## Coalville.

The Berks. Aviation Co. have just concluded a ten days' flying visit here, from a site on Ashby Road. Although the coal strike handicapped the promoters rather severely, 150 passengers were carried, including the Chairman of the Leicestershire Miners' Association.

## Kettering.

The Berks. Aviation Co. are giving exhibition and passenger flights here daily from the Headlands. In spite of the inclement weather the flights are proving exceedingly popular. Free flights are being given by arrangement with the *Kettering Guardian*, some 2,000 applications being received for the ten flights offered.

## Stag Lane.

On Thursday of last week Mr. Shaw delivered the last of the three de Havilland 14s to the R.A.F. at Martlesham. It was a very bad day, but, nevertheless, the trip only occupied 50 minutes.

On the following day an American business man missed the boat train from Waterloo by a minute, so he rang up the Telephone Exchange to ask where he could obtain an aeroplane. The first name that occurred to the operator was de Havilland (such are the powers of good advertisement), which company he promptly rang up. A D.H.9 was at once prepared and was ready to get off as soon as he arrived.

Owing to there being no aerodrome at Southampton, the pilot, Mr. Hackett, had to land at Eastleigh, some six miles from Southampton. Unfortunately the slowness of ground transport caused the American to miss the boat by 15 minutes, though had Southampton had an adjacent aerodrome he would have caught the boat with plenty of time to spare. The machine left Stag Lane in a snowstorm. If the pilot had gone to Hamble instead, doubtless the Avro people would have done the needful with a car or a float machine.

The same day Mr. Hearn flew over to Stag Lane on a de Havilland 6 (G-EAGF) belonging to the Hon. Mrs. Wyndham. Mrs. Wyndham has bought the machine and Mr. Hearn is teaching her to fly. He brought the machine over to the de Havilland Aircraft Company for minor adjustments.

Capt. Geoffrey de Havilland frequently flies his own private D.H.6 for pleasure and business.—G. D.

## AIR-LINE ERRORS.

The following letter has been received :—

Sir,—I thought I should like to give you my experience of a flight from Paris to London by the International Service, as a little criticism sometimes is not amiss, and I think I am entitled to speak with a certain amount of authority, having been a pilot for three years in both seaplanes and land machines.

Last week being on the Continent, and on my way back home, I thought I would like to fly back and see for myself how this new passenger service was progressing. Arriving in Paris at 9.10 a.m. I went straight to Cook's to book my seat. This I managed to do after a little difficulty, every seat being already booked. However, change of mind on the part of a would-be passenger, I was offered the seat and gladly secured same. It is very pleasing to see the amount of patronage this new mode of travel is receiving.

I was told the start would take place at 11 a.m. sharp, and was accordingly rushed off with four other passengers to Le Bourget, only to find the rest of the passengers had not turned up. However, at 11.30 we were ready to start in a D.H.18; the engine being started, it was then found that one of the throttles would not open. I should like to know why this was not found out earlier. Nearly all the passengers were going up for their first flight, and it was not very reassuring. Eventually at 12 o'clock we took off. The engine was started, warmed up for two minutes (I'd been there one and a half hours and I believe an engine can get cold in that time and the oil would be thick), which I consider is a very short time to warm up even if the engine had been run previous to my arrival on the ground.

The engine was not even tried for revs., and we taxied straight out and got off. One would have thought the pilot would have circled the 'drome once before starting on a long cross-country and Channel flight, to make sure of everything, but no, off we went, and certainly arrived quite safely in three hours.

Now as regards safety which we hear so much about. One of the passengers was shown how to work a Perrins belt, after everyone else was in the machine and the engine running. But none were told not to blow them up till after they had managed to get clear of the wreckage, if the machine had got ditched, which is essential. I have been caught twice under water myself, and if I had blown my belt up before I had crashed I would never have got away.

No one was told about the emergency doors in the top of the fuselage, which you in an article some time ago pointed out as a feature of the machine. I asked a mechanic and was told in a careless way, "Oh, you get out there if you crash." How one did, he did not say, nor was there any notice stating the use of them, or even stating where they were.

Now this does not make a good impression: first, we start one hour late; secondly, no one is told of any safety device, or how to get out of the machine if it crashes. It is no good saying it won't crash or the engine fail over the sea, even railway engines break down sometimes. Also it added one hour to the total time of journey. One of the passengers was, as far as I could make out, the head of a big banking and trading business, and as it was his first flight, the impression of it would stick. To say the least of it his impression was not a good one, hence no money will come from his concern.

The one thing that did impress me were the Customs officials on both sides, who got me through very quickly. Also everyone was very civil, but did not volunteer any information.

I may say I will certainly fly over again, as I find it saves a good deal of time and trouble, but hope by next time to see some improvement in the organisation.

(Signed) J. A. Gladstone.

Darlington, April 12th, 1921. (Capt.) late R.A.F.

# AIRCRAFT IN PARLIAMENT

## HOUSE OF COMMONS.

The following oral answer was given on April 5th:—

### CROSS CHANNEL MAIL TRAFFIC.

Mr. RAPER asked the Postmaster-General how many voyages between British ports and the Continent of mail steampships were scheduled to take place in 1920, how many were cancelled owing to bad weather, and on how many days did these mail carrying ships fail to run owing to bad weather.

Mr. PIKE PEASE, replying, said that 4,006 such voyages were scheduled to take place in 1920, five of which were cancelled owing to bad weather. On no day was communication with the Continent entirely suspended.

* * *

The following written answer was given on April 11th:—

### PIECEWORK IN FACTORIES.

Replying to Mr. J. WILSON, who asked whether all firms are paying employes on the piecework system, and, if not, what percentage of aircraft parts, made on piece-time rates failed to pass Air Ministry inspection as compared with parts made on time rates, Captain GUEST said the majority of firms employ a proportion of their staff on time rate. No statistics are available as parts are examined by firm's inspectors first. No instance is known of identical parts being manufactured under piecework and under time-work conditions.

* * *

The following oral answers were given on April 12th:—

### PASSENGER AIR SERVICES.

In reply to Mr. RAPER, who asked for the terms of the agreements between Messrs. Handley Page, Instone and Co. Ltd., and the Government, Mr. McCURDY said the basis of the interim agreement is that an approved number of flights, probably one each way, is secured from loss to the company by subsidy from the Government subject to a maximum liability. The profits, however, are limited to 10 per cent. of the receipts from passenger fares and freights, irrespective of whether the flight costs more or less than the subsidy.

### THE EASTBOURNE AERODROME.

Mr. RAPER, having asked why Notice to Airmen No. 135 was cancelled, Mr. McCURDY said the notice in question was cancelled because the periodical list of aerodromes to which it was a correction was also cancelled. The current periodical list does not include the Eastbourne aerodrome.

* * *

The following oral answer was given on April 13:—

### THE TERRITORIAL AIR FORCE.

In reply to Brig.-Gen. COLVIN, Mr. McCURDY said:—I have been asked to reply. A draft of a scheme for the formation of a Territorial Air Force is now under discussion with the various authorities concerned, and I hope that it may be possible to inaugurate it during the course of the present year.

* * *

The following written answer was given on April 13th:—

### THE AIR MINISTRY HEADQUARTERS STAFF.

In reply to Major J. EDWARDS, Capt. GUEST said:—I have been asked to reply. On January 1st, 1921, the headquarters staff employed at the Air Ministry consisted of 1,303 ex-service men, 550 non-ex-service men, and 538 women. On April 1st, 1921, the numbers were—1,285 ex-service men, 448 non-ex-service men, and 423 women. This information is embodied in Returns presented to Parliament each month as Command Papers.

* * *

The following replies were communicated by letter to the Member concerned on March 24th, 1921:—

### ALLOWANCES.

Mr. RAPER: To ask the Secretary of State for Air, whether the rates of lodging, fuel and light allowances for married officers of the Royal Air Force are issued on the same scale and under the same regulations as for married officers in the Army; whether the latter when not in occupation of married quarters are granted a furniture allowance of 2s. per diem in addition to the lodging, fuel, and light allowances above mentioned; whether this furniture allowance is also issuable to married officers of the Royal Air Force; and, if not, what is the reason for this differentiation.

*Answer.*—The rates of lodging, fuel and light allowance for Married Officers of the Royal Air Force are the same as those for Married Officers of the Army, but the furniture allowance authorised for the Army is not applicable to the Royal Air Force.

The scheme of pay and allowance authorised for the R.A.F. taken as a whole is considered to be no less advantageous to the officer than that of the Army, and was designed to meet the character and requirements of service in the R.A.F. which differ from those of the Army.

### FUEL AND LIGHT ALLOWANCE.

Mr. RAPER: To ask the Secretary of State for Air, whether an Army order was recently issued increasing as from October 1st the rate of fuel and light allowance payable to Army officers in view of the increased cost of coal and gas; whether this increase has also been granted to officers of the Royal Air Force; and, if not why not.

*Answer*—Instructions are being issued which will give to married officers of the Royal Air Force the same rates of fuel and light allowance as have been approved for the Army as from October 1st, 1920, The question of the allowances payable to single officers is under consideration.

# THE ROYAL AERO CLUB.

## WEEKLY NOTICES.

### THE COMMITTEE, 1921.

Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S. (Chairman); Lieut.-Col. J T. C. Moore-Brabazon, M.C., M.P. (Vice-Chairman); Major-Gen. Sir Sefton Brancker, K.C.B., Ernest C. Bucknall, G. B. Cockburn, Lieut.-Col. John D. Dunville, Col. F. Lindsay Lloyd, C.M.G., C.B.E., Lieut.-Col. F. K. McClean, Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F., The Viscount Northcliffe, Lieut.-Col. Alec Ogilvie, Lieut.-Col. Mervyn O'Gorman, C.B., F. Handley Page, Rear-Admiral Sir Godfrey M. Paine, K.C.B., M.V.O., Group-Captain C. R. Samson, C.M.G., D.S.O., R.A.F., Sir Mortimer Singer, K.B.E., J.P., T. O. M. Sopwith, The Viscount Tiverton.

### RACING COMMITTEE.

A Meeting of the Racing Committee was held on Wednesday last, April 13th, 1921, when there were present Group-Capt. C. R. Samson, C.M.G., D.S.O., R.A.F., in the Chair, Major-Gen Sir Sefton Brancker, K.C.B., Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Col. F. Lindsay Lloyd, C.M.G., C.B.E., and the Secretary.

*Aerial Derby,* 1921.—It was decided to offer the following Prizes for the Aerial Derby, 1921:—

Fastest Time (Winner of the Aerial Derby). Trophy and £400. Handicap:—1st Prize, Trophy and £200; 2nd Prize, £100; 3rd Prize, £50.

It was also decided that the regulations and General Conditions should be the same as in 1920.

The Committee also discussed the arrangements for the Jacques Schneider Race, Cowes Meeting and the Oxford and Cambridge Race.

### COMMITTEE MEETING.

A meeting of the Committee was held on Wednesday last, April 13th, 1921, when there there present Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the Chair, Major-Gen. Sir Sefton Brancker, K.C.B., Mr. Ernest C. Bucknall, Col. F. Lindsay Lloyd, C.M.G., C.B.E., Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., Lieut.-Col Alec Ogilvie, Lieut-Col. Mervyn O'Gorman, C.B., Rear-Admiral Sir Godfrey M Paine, K.C.B., M.V.O., Group-Capt. C. R. Samson, C.M.G., D.S.O., R.A.F., Sir Mortimer Singer, K.B.E., J.P., and the Secretary.

*Election of Chairman.*—On the motion of Lieut.-Colonel Mervyn O'Gorman, C.B., seconded by Major-General Sir Sefton Brancker, K.C.B., Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., was unanimously elected Chairman of the Club for the current year.

*Election of Vice-Chairman.*—On the motion of Lieut.-Col. Alec Ogilvie, seconded by Mr. Ernest C. Bucknall, Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., was unanimously elected ViceChairman of the Club for the current year

*Vacancy on Committee.*—Viscount Tiverton was co-opted to the Committee to fill the vacancy caused by the retirement of the Duke of Atholl on his election as President of the Club.

*Stewards of the Club.*—The following were elected the Stewards of the Club for the current year:—

The Earl of Lonsdale, the Rt. Hon. Lord Hugh Cecil, M.P., The Lord Kinnaird, K.T., F.R.G.S., J.P., D.L., Admiral of the Fleet Sir

Edward Seymour, G.C.B., O.M., G.C.V.O., Hon. Sir Arthur Stanley, K.C.M.G., Lieut.-Gen. Sir David Henderson, K.C.B., D.S.O.

*Appointment of Sub-Committees.*—The following Sub-Committees were appointed for the current year :—

*Technical Committee.*—Capt. W. G. Aston, Griffith Brewer, Eng.-Com. W. Briggs, R.N., Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F., Major R. H. Mayo, Lieut.-Col. Mervyn O'Gorman, C.B., The Viscount Tiverton, Lieut.-Col. H. T Tizard, Howard T. Wright.

*Racing Committee.*—Major-Gen. Sir Sefton Brancker, K.C.B., G. B. Cockburn, Col. F. Lindsay Lloyd, C.M.G., C.B.E., Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F., N. C. Neill, Group-Capt. C. R. Samson, C.M.G., D.S.O., R.A.F.

*House Committee.*—Major H. Graeme Anderson, Ernest C. Bucknall, Herbert J. Corin, Lieut.-Col. F. K. McClean, D. C. MacLachlan, J. Stewart Mallam, D. G. Murray.

*Finance Committee.*—Ernest C. Bucknall, Lieut.-Col F. K. McClean, J. H. Nicholson, Lieut.-Col. Alec Ogilvie.

*Flying Services Fund Committee.*—H.R.H. The Duke of York, K.G., Lieut.-Col. Alan Dore, D.S.O., Chester Fox, Squadron-Leader T. O'B. Hubbard, M.C., R.A.F., Group-Captain C. R. Samson, C.M.G., D.S.O., R.A.F.

*Library Committee.*—C. G. Grey, Major C. C. Turner, Howard T. Wright.

*Joint Standing Committee of the Royal Aero Club and the Society of British Aircraft Constructors.*—Lieut.-Col. F. K. McClean, Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., Lieut.-Col. Alec Ogilvie, Rear-Admiral Sir Godfrey M. Paine, K.C.B., M.V.O.

*Racing Fund.*—In order to carry out the proposed Racing Programme for this year the Committee voted a further sum of One Thousand Pounds to the Racing Fund

*Election of Members.*—The following New Members were elected :—Peter Chalmers Mitchell, C.B.E., F.R.S., LL.D., D.Sc., Clive Rassenden Verey.

*Life Membership.*—An application for Life Membership from Mr. William Wilson, J.P., was approved.

*Flying Services Fund.*—Report of Meeting of Flying Services Fund Committee held on March 17th, 1921, was received and adopted.

*Aviator's Certificate.*—The following Aviator's Certificate was granted : 7914 Charles Edward Nelson Smith.

*Aeronaut's Certificate.*—The following Aeronaut's Certificate was granted :—278 Charles Cyril Turner.

### INTERNATIONAL AVIATION RACE MEETING.

### THE AERIAL DERBY

(Under the Competition Rules of the Royal Aero Club and the Regulations of the Federation Aeronautique International), at the London Aerodrome, Hendon, N.W. (by arrangement with the Grahame-White Co. Ltd.), on Saturday, July 16th, 1921.

*Prizes.*—The following Prizes will be presented by the Royal Aero Club :—

Fastest Time (Winner of the Aerial Derby), Trophy and £400. Handicap :—1st Prize, Trophy and £200; 2nd Prize, £100; 3rd Prize, £50.

### REGULATIONS.

*Qualification of Competitors.*—The Competition is open to persons of any nationality holding a licence issued by any Aero Club affiliated with the Federation Aeronautique Internationale.

*Organisation.*—The Competition shall be conducted by the Royal Aero Club under the Competition Rules of the Royal Aero Club and the Regulations of the Federation Aeronautique Internationale.

*Entries.*—The Entry Fee is £10. This fee, together with the Entry Form, must be received by the Royal Aero Club, 3, Clifford Street, London, W.1, not later than 12 noon on Wednesday, July 6th, 1921.

*Course.*—The Course is approximately 200 miles, and will consist of a double circuit of London, starting from the London Aerodrome, Hendon, with the following turning points :—Brooklands Aerodrome, Weybridge, Epsom, West Thurrock, Epping, Hertford.

### FLYING SERVICES FUND.

*Subscriptions.*—Total Subscriptions received to April 4th, 1921, £17,215 3s. 1d.; Squadron-Leader P. Litherland Teed, R.A.F. (Eleventh contribution), £4. Total, April 18th, 1921, £17,219 3s. 1d.

## THE ROYAL AERONAUTICAL SOCIETY.

*Council.*—The full list of the Council for the year 1921 is as follows :—Air-Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C., (Chairman), Brig.-Gen. R. K. Bagnall Wild, C.M.G., C.B.E. (Vice-Chairman), Dr. L. Bairstow, C.B.E., F.R.S., Major F. H. Bramwell, Wing-Cmdr. Cave-Browne-Cave, C.B.E., Sir Robert Hadfield, Bt., F.R.S., Capt. G. de Havilland, O.B.E., A.F.C., Prof. B. Melvill Jones, Major A. R. Low, Lt.-Col. J. T. C. Moore-Brabazon, M.C., M.P., Lt.-Col. A. Ogilvie, C.B.E., Lt.-Col. M. O'Gorman, C.B., Dr. A. J. Sutton Pippard, Mr. A. V. Roe, Major-General Sir R. M. Ruck, K.B.E., C.B., C.M.G., Col. the Master of Sempill, A.F.C., Major R. V. Southwell, Lt.-Col. H. T. Tizard, A.F.C., Brig.-Gen. J. G. Weir, C.M.G., C.B.E., Major H. E. Wimperis, O.B.E., Mr. A. E. Turner (Honorary Treasurer).

*Students.*—It is proposed to endeavour to increase the interest of Students by offering the Society's bronze medal annually for the best student's paper admitted, and by arranging for students' meetings for purposes of debating among themselves. In the latter connection it is hoped shortly to be able to announce the donation of a prize annually for the best paper initiating discussion at one of these students' meetings.

*Silver Medal.*—It has been decided to revive the practice of awarding the Society's Silver Medal annually for the best paper contributed to the *Aeronautical Journal* during the year.

W. LOCKWOOD MARSH, Secretary.

## PERSONAL NOTICES.

**[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]**

### DEATHS.

MUNDAY.—On April 9th, at a nursing home in Brussels, Renee Marie, dearly beloved wife of Flt.-Lieut. Richard Burnard Munday, D.S.C., R.A.F., and younger daughter of M. and Mme. Percy of Aerschot, Belgium, in her 21st year.

TAILYOUR.—On April 11th, at Camp Borden, Ontario, the result of a flying accident, Major R. K. Tailyour, Canadian Air Force, eldest son of Alexander Tailyour, of Clifton Croft, Ashbourne, aged 39.

### ENGAGEMENTS

LOCKE WATERS—BURRAGE.—The engagement is announced between Flying Officer E. A. Locke Waters, R.A.F., only son of the late Major G. H. A. Locke Waters, of Cape Town, South Africa, and Joanna, younger daughter of Mr. and Mrs. Drew Burrage, Manchester.

LONGCROFT—HEPBURN.—A marriage has been arranged, and will shortly take place, very quietly, between Air Commodore C. A. H. Longcroft, C.M.G., D.S.O., A.F.C., R.A.F., and Marjory, widow of Capt. W. D. Hepburn, Seaforth Highlanders.

MORSLEY-CARR—SIMPSON.—A marriage has been arranged, and will shortly take place, between Major A. G. Horsley-Carr (late R.A.F.) and the Hon. Mrs. Hamilton Simpson, 105, Coleherne Court, S.W., widow of Lieut. J. C. Simpson, R.E., and the youngest daughter of Georgina Lady Bellhaven and Stenton.

SMITH—BERRY.—A marriage has been arranged between Wing Commander Sidney Smith, D.S.O., A.F.C., Air Ministry, London, and Miss Winifred Poole Berry, The Priory, Grantham, and will take place at 2.30 p.m. on Wed., May 11th, at St. Wulfram's Church, Grantham.

### MARRIAGES.

GARDNER—THOMAS.—On April 14th, at the Parish Church, Baglan, by the Rev. E. G. E. Richardson, M.A., Major Cyril Herbert Gardner, A.F.C., son of the late Colonel A. S. Gardner, V.D., D.L., R.A., of Neath, to Emy Nesta Thomas, second daughter of the late Dr. J. W. Thomas and of Mrs. Thomas, The Wern, Neath.

HOLT—THOMPSON.—On April 12th, at St. Mary's, Great Chart, by the Rector, Rev. N. A. Holt, M.A., B.D., father of the bridegroom, Capt. F. Neville Holt, to Irene Thirza, widow of Lieut. William George Thompson, R.A.F. (killed in action, July 14th, 1917).

### BIRTHS.

BRYCE-CURTIS.—April 14th, at 5, Edenhurst Avenue, Hurlingham, to Kathleen, wife of Flt.-Lt. W. J. Bryce-Curtis, O.B.E., R.A.F., the gift of a son.

FANE.—On April 1st, at 15, St. Leonard's Terrace, Chelsea, the wife of Gerard W. R. Fane, D.S.C.—a son.

HOOPER.—On April 9th, at a nursing home, Torquay, the wife of Squadron Leader A. F. A. Hooper, O.B.E., R.A.F., of a daughter (stillborn).

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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... ... ... ... 383
Aircraft Disposal Co., Ltd., The ... ... 377
Armstrong Siddeley Motors, Ltd. ... ... 379
Arrol-Johnston, Ltd. ... ... ... *Front Cover*
Auster, Ltd. ... ... ... ... ... *Front Cover*
Beardmore Aero Engines, Ltd., The *Front Cover*
Bristol Aeroplane Co., Ltd. ... ... ... 375
Cellon, Ltd. ... ... ... ... ... ... 377
Cunard Line ... ... ... ... ... ... 384
De Havilland Aircraft Co., Ltd., The... ... 375
Fairey Aviation Co., Ltd., The ... ... ... 369
Hancock, James Lyne, Ltd. ... ... ... 384
McGregor, Gow, & Holland, Ltd. ... ... 383
Metal Airscrew Co., Ltd.... ... .. *Front Cover*
New Pegamoid, Ltd. ... ... ... ... 384
Nieuport and General Aircraft Co., Ltd. *Back Cover*
Roe, A. V., & Co., Ltd. ... ...*Inside Front Cover*
Short Bros., Ltd. ... ... ... ... *Back Cover*
Titanine, Ltd. *Front Cover & Inside Back Cover*
Westland Aircraft Works... ... ... ... 373

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## ON THE AIR ESTIMATES.

As usual, when one has decided to publish something really useful and instructive and constructive in this paper, something else arrives which upsets the plan of campaign. In this particular instance, as indicated last week, it was desirable to lay down some kind of scheme by which practical help could be given to Civil Aviation during the next few weeks. But it pleased the Government to hold a Debate on the Air Estimates on Thursday, April 21st, and, as such a Debate is a matter of historical interest and is necessarily inadequately discussed in the daily news-sheets, it is necessary to devote considerable space to it in THE AEROPLANE

The notable features of the Debate were the debut of Captain Guest, the new Air Minister, and the appearance of Mr. Baldwin Raper as a trenchant if friendly critic. A slow starter is frequently a good finisher, and on this hypothesis there appears to be hope for Captain Guest. Also he seems to have some sense of his own limitations in that at the opening of his speech he said, "The policy of the Air Ministry is one which I have inherited, and therefore the House will hardly expect from me anything particularly flamboyant or original."

One does not know Captain Guest sufficiently well to be able to judge whether this remark is a subtle jest at the expense of his predecessors, General Seely and Mr. Churchill respectively, or whether it is an almost equally subtle gibe at the oratorical taste of the House of Commons or whether it actually expresses an honest belief that to be successful a Minister ought to be flamboyant and original in speech. For his own sake one hopes that the third is not the true explanation.

One thing was abundantly clear in the speech, namely, that Captain Guest knows very little about aviation, and it is to his credit that he does not pretend to know anything about it. His style is not inspiring, but it is free from any glaring defects. He succeeded in splitting one infinitive most effectively, but he seems to avoid "and whiches" and terminal prepositions, for which one is grateful to him.

### State Secrets and Startling Statements.

His first startling statement was that during the war the science of aviation advanced a hundred years. One feels sure that Captain Sayers would be pleased to demonstrate to Captain Guest that the science of aviation has been retarded at least five years by the war. In proof whereof, consider the number of highly efficient new wings and airscrews now being developed, whereas during the war nobody thought of anything except cramming on more power and cutting out more weight.

Referring to the Department of Civil Aviation, Captain Guest said, "This responsibility of the Government for maintaining and retaining all the secrets of science which the War developed, and preserving them for the benefit of the civil population at [*sic* Hansard. Probably Capt. Guest said "till."] such a moment as they may be able to take over this method of transport for themselves, is one which puts this item in the Vote in a very special category."

Just why the Government should retain the secrets of science instead of handing them over to the Aircraft Industry to be used in the best possible manner seems to need a little explanation. At the same time one does not believe that any secrets of great importance are being retained At any rate British aircraft designers on the whole seem to know rather more about the science of aircraft design than do the servants of the Government, at any rate on the average.

### Justifiable Expense.

Some few facts announced by Captain Guest in his speech are of interest in that they are not common knowledge. For instance, by way of excusing the expenditure on Halton he explained that boys are enlisted between the ages of 15 and 16½, and are sent there for technical training, and it is hoped when the school is in full operation to turn out a thousand trained mechanics per annum for the R.A.F.

As the course of training must take three years, the buildings there are necessarily designed to accommodate 3,000 boys and young men together with an adequate staff. During the war workshops and technical buildings of various kinds were built at Halton at a cost of £1,000,000. Therefore it is obviously cheaper to build living accommodation round the workshops than to try and set up an entirely new establishment elsewhere.

As regards Cranwell, he said that there are at present 120 cadets there and a thousand boy mechanics who cannot at present be housed at Halton.

Further on the subject of buildings Captain Guest stated that £163,000 is being spent on buildings in Egypt, "the major portion of it being devoted to the provision of married quarters." This also appears to be justifiable expenditure, even though it may suggest by its amount that the R.A.F. in the East is contemplating conversion to Islam. At any rate, it seems to be necessary, judging by a letter from a friend in Egypt a year or so ago complaining that he could not get a passage for his wife from England to Egypt, nor, if he got her to Egypt, could he find living accommodation for her. He seemed divided in mind as to whether to resign from the R.A.F. or to commit bigamy, or to become a Mahommetan.

### Civil Aviation.

Referring to the savings made by the Director General of Civil Aviation last year, Captain Guest said that they were made chiefly because of "the want of interest, so far as one can judge, which the general public took in Civil Aviation." While one is the last person in the world to advocate the bolstering up of inefficient Civil Aviation concerns with public money, one must really protest against the suggestion of the lack of interest in aviation on the part of the general public.

As a matter of fact the general public is intensely interested in Civil Aviation if it has an opportunity of taking an interest in it. This is shown by the astounding number of people who have flown as passengers whenever they have been able to do so at a moderate price. If the Department of Civil Aviation had spent its money on facilitating the operation of commercial aeroplanes by providing cheap or free aerodromes, and especially by making the London-Paris Air Route so safe, by means of proper telephone and wireless systems, that commercial firms could use the route without fear of accident, it might have done very much more to help the progress of Civil Aviation than it did.

### A Scandalous Arrangement.

Turning to the subject of the recently arranged subsidy Captain Guest disclosed a state of affairs which can only be described as scandalous. Starting with the statement that the sum of £60,000 has been allocated for the encouragement of civil aerial transport companies he went on to state that an agreement is being made on the following terms :—

Its operation is limited to seven months, "to give an opportunity of seeing what response is received from the general public."

There is to be only one machine flown in each direction each day.

This, of course, is in itself simply fatuous. Already it is evident that one machine per day in each direction is hopelessly inadequate. People who want to cross by air do not want to be tied down during the Summer months to one machine at midday. Some want to arrive in Paris or leave London before lunch and some want to leave after lunch or even later. Complaints are already constantly being made that the machines are booked up. They do not necessarily carry their full complement of passengers, but that is, as a rule, because owing to the amount of goods stuffed into the machines there is no more room for passengers.

Even last year, without the subsidy and at the absurdly high fares then being charged, there were enough passengers to justify running three and frequently four or five machines per day in each direction. Yet there we have a Department, which is presumably staffed by intelligent people, professing to believe that one machine a day at reduced fares will give an opportunity of "seeing what response can be got from the public." The idea is purely imbecile.

The idea apparently is to avoid spending the whole of the £60,000 subsidy before the end of the Summer. Surely it would be very much better to offer the subsidy to every machine that the subsidised companies can put in the air adequately filled with passengers and goods so long as the £60,000 lasts. Then there would be some opportunity of seeing what the public thought about it

As it is, instead of tempting new people with brains and enterprise to come into Civil Aviation, this allocation of a big subsidy to a few machines over a prolonged period is the best possible way of keeping enterprise and intelligence out of Civil Aviation. What we want is new lines with new machines, not a monopoly for two old lines working in alliance.

### Wanton Generosity.

When one comes to consider the actual financial agreement it seems to be a still more wanton method of handling public money. Here is the arrangement as stated by Captain Guest: "The Air Council guarantee a clear profit of 10 per cent. to each firm on gross receipts, excluding subsidies, obtained for the carriage of passengers, goods, and mails, any excess to be returned to the Air Ministry The subsidy is to be £75 for each single flight, treated on a schedule basis, and provided that the maximum payable does not exceed £25,000 to each firm for this period of seven months."

This sounds complicated, but it is, one believes, fairly simple in effect. It is only Captain Guest's wording that is peculiar. Apparently each machine draws £75 as a lump subsidy per trip. On top of that it gets 10 per cent. of its gross receipts as an added subsidy. *But* this 10 per cent. may be made less if the £75 plus the 10 per cent. together amount to more than 10 per cent. profit on the running costs. One hardly imagines that any firm trained by handling Excess Profits Duty would allow itself to make as much as 10 per cent. profit, so long as this foolish subsidy was available.

If a firm cannot run a machine like the D.H.18 or the Handley Page at £75 per trip plus 10 per cent. of its gross receipts from passengers and goods then it is time the firm went out of business. Considering that it is possible for a really hardworking skillfully organised joy-ride company to support six people year in year out merely from pleasure flights at a guinea a head with two Avro biplanes, which is what the Berkshire Aviation Co. have done, it looks as if a properly organised London-Paris Air Service ought to be able comfortably to put the whole of that £75 subsidy per trip into its pocket with the help of a little skilful camouflage.

### An Imaginary Balance-Sheet.

As illustrating the arrangement, Captain Guest quoted a hypothetical balance-sheet of an imaginary air line working on this subsidy system. Here is his statement:—

"On the credit side of the company's account book for a month, I have reckoned 24 as the number of flights. That would place on the credit side £1,200, allowing for an average of £50 taken as fares on each flight. On the same side of the account also I place 24 times £75, the amount of the subsidy for each flight, making a sum of £1,800. On the debit side of the account, I place the operating cost, which at a rough calculation is put at £150 per flight, giving a total of £3,600.

"The balance-sheet therefore stands as follows:—On the credit side, £1,200 for fares and £1,800 for subsidy. On the other side, operating costs £3,600, and if you deduct from that sum the amount taken for fares to which is to be added 10 per cent. you get a figure of £2,280.

"As, however, £1,800 has already been advanced to the company as shown on the credit side of the account, you will find that the final payment will be £480 for the month."

All one can say about it is that the Estimate of £150 for the operating cost of each flight to Paris errs on the side of generosity. If the men whose health has been wrecked for life in the King's Service during the war had been treated as generously by the Ministry of Pensions as these temporary air lines have been treated by the Department of Civil Aviation, this country would be vastly happier than it is, even if its taxation might be a trifle heavier. If generosity can ever be scandalous then certainly this is a case of scandalous generosity.

According to Captain Guest the Air Ministry has been forced into this lavish expenditure by the fact that "The French subsidy has enabled the French companies to charge only £5 a flight." This, of course, is pure nonsense. The French companies charge 300 francs per flight. It is true that, at the present rate of exchange, this only represents £5 or thereabout to an Englishman, but 300 francs in France represents considerably greater value than £5 does in this country.

### Necessary Inspection.

In the course of the speech Major Claud Lowther interpolated a question as to whether the Ministry has a right to supervise the efficient manning of the company's fleet. Captain Guest, in his innocence, did not think that such a right exists. So far as the pilots and the ground personnel are concerned the Air Ministry certainly has such a right in that it issues certificates for pilots and ground engineers.

One might even suggest that if the country's money is to be handed out thus generously the Air Ministry might also insist on issuing certificates to and insist on the right of examination of the business personnel of the firms concerned. There is very little use in having first-class pilots and first-class mechanics if machines do not turn out to time and if goods are not delivered promptly from the senders to the aerodrome or from the aerodrome to the addressees and if office charges are not in proportion to the amount of business done.

The rest of Captain Guest's speech dealt quite cursorily with the various Votes other than personnel and Civil Aviation.

## THE DEBATE.

**Sir William Joynson Hicks**, who seems to have assumed the prerogative of opening Air Debates, complained that the Secretary of State for Air had not a seat in the Cabinet in spite of the promise of the original Air Act. To this one retorts that the great argument in favour of the combination of the War Minister and Air Minister in the Person of Mr. Churchill was that the Air Minister had a seat in the Cabinet by virtue of being War Minister. As it is the Cabinet is already much too large and hardly ever meets as a full Cabinet. The result is that the Nation's affairs are run by a small cabal inside the Cabinet. All of which is simply an argument in favour of having a Minister for War with Under-Secretaries for the Navy, Army, and Air Force.

Sir William also complained about the small attendance of members. This complaint was just as frequent during the War when even the House of Commons was somewhat interested in Air Power, so it is not surprising that members should not be interested in these days of coal strikes and Triple Alliances. He made the excellent point that the House is as responsible to-day as ever for seeing that there is adequate preparation for military aviation as it was in 1912-14.

He complained, very rightly, about the fact that we were only running one machine per day from London to Paris, but he made the mistake of holding up the French subsidy rather as a thing to be imitated. The only effect of the French subsidy in fact is to maintain in existence inadequate types of civil aircraft.

Sir William did, however, make the good point that the French are offering all kinds of facilities to their pilots for practising on Government machines whereas nothing of the kind is being done here.

He said, very rightly, that if civil aviation is to consist of one service carrying seven passengers per day each way between London and Paris there is an end of civil aviation. He said that on the other hand if there was to be one big national company subsidised by the Government there would be an end to free competition. There, of course, he is wrong, for this one company would develop aviation on a big scale and when aviation was adequately developed there would be room then for young and energetic firms to start in competition with it.

He advocated that there should be a constant policy for six or twelve months ahead and that manufacturers should be given orders for commercial machines to be delivered at regular intervals so that they could maintain a proper staff of engineers, designers and so forth.

In reply to a question by Sir Frederick Banbury as to what would be done with these aeroplanes when the Government had bought them, Sir William said that these machines could be leased to civil aviation companies as is being done with some machines to-day.

Sir William also complained about the neglect of airships and advocated that the Zeppelins, and R.33 and R.36 now at Pulham should be put to some use. Apparently he still believes that airships of the present type can be of use in war. Nevertheless, he admitted that when it comes to a choice between the two, and we cannot have both, we should prefer aeroplanes to airships.

### R.A.F. Stations.

Referring to Halton, Sir William referred to the beautiful accommodation provided in Baron Rothschild's house for officers and then besought Captain Guest to save money on buildings. Seeing that the officers already have this magnificent mansion surely it is very undemocratic to object to money being spent for the comfort of the rank and file, especially when one considers that at one time Halton was regarded as a plague-spot owing to its distinctly insanitary housing arrangements for the men.

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He also considered that Air Force stations did not show very much interest in aviation and cited Martlesham Health of a few weeks ago as an example. He evidently forgot that Martlesham Heath is an experimental station, that experimental machines are not produced at a rate of several a day, and that during its existence an experimental aeroplane spends very much more time in the workshops being altered or adjusted in one way or another than it does in the air in the process of actual flying tests.

It is amusing to see him holding up the United States as an example to us in their realisation of the value of aviation in any future war. It is always the people in the United States who hold up Great Britain to their fellow-citizens as *the* great example of aerial preparedness.

## The Practical Man.

**Mr. Baldwin Raper,** formerly a pilot R.A.F., followed Sir William Joynson Hicks, and revealed himself as one of the coming men in aerial politics. As the *Times* remarked in discussing the Air Estimates, he "examined the finance of the Estimates closely and well," a little matter which other Members seem to have neglected. He had the moral courage to regret that the financial state of the country does not justify our voting more money for aviation, and said: "We should spend as much as possible on research work to get the best possible machines and equipment and the best trained men so that in the event of war we should have the nucleus to reform a large air service."

He hoped that the new Secretary for Air was not influenced by the erroneous idea that civil pilots and civil machines are in any way interchangeable with war pilots and war machines, and he suggested very rightly that, with exceptions, the ordinary pilot of the London-Paris route is no more fitted, either temperamentally or by experience, for long range reconnaissance or bombing machines "than an engine driver is fitted to drive a tank."

He defended the expenditure on Halton by saying that just as commercial machines are unsuitable for war purposes it is quite wrong to think that in war we could go to the nearest garage or some motor school and get trained mechanics. He said that the proper training for air mechanics could not be obtained unless they were educated when young at a suitable school.

Taking the official figures of 2,165 officers, of whom 1,136 are flying and observer officers, he showed that we should not have pilots and observers for more than 250 machinse, which was quite insufficient.

## Timely Jests.

Jestingly he wanted to know whether the item "Hard Lying money £500" referred to some Department of Propaganda or Information. Later, in the same vein, he referred to the item in the Meteorological Vote, "Atmospheric Pollution £300," and said:—"To what does that refer? Does it refer to the language employed at the Air Ministry, or by the pilots who unfortunately are misled and crash owing to incorrect information given by the Meteorological Department? If it refers to these unfortunate pilots, it is a great testimony to the splendid reform which has been effected among them."

## R.A.F., T.R.

Referring to the phrase "Territorial Air Force" used in the Estimates, he objected to it on the grounds that "Territorial Force" is usually understood to refer to the Army, and suggested that this name be changed to "The Royal Air Force Territorial Reserve."

He also referred to the French Government's excellent method of allowing reserve pilots to fly Government machines free of charge

## Kit Allowance.

Being eminently a practical person, Mr. Raper brought up the question of kit allowances in the R.A.F., and said that cadets entering the Army are given £240 kit allowance as against the mere £50 offered in the R.A.F. One fears that the real reason why the R.A.F. cannot make an adequate kit allowance is that, whereas the Army only has to provide quite a small number of kit allowances at £240 for the officers leaving Woolwich and Sandhurst each year, the R.A.F. would have to provide all of its 2,165 officers with kit allowance, which would run into a matter of half a million pounds. One imagines it is merely lack of money and not lack of generosity which prevents the Air Ministry from doing the right thing.

Touching on the matter of the reduced Vote for petrol and oil, he hoped that this did not mean that the R.A.F. was doing less flying, but that it merely indicated that there were large stocks in hand and that petrol would be cheaper in future. While on this subject he referred to the lack of adequate storage tanks with quick filling arrangements at Croydon.

Mr. Raper also referred to the £700,000 voted for war liabilities, including rewards to inventors, and hoped that none of this would be thrown away in rewards for inventions which were never used, as had been the case in the past. He pointed out that the Lands and Buildings Vote of the Air Ministry, which is the most expensive is at the same time the most unsatisfactory, not because he objected to the necessary buildings but because he thought that certain of the buildings, as at Malta, were unnecessary. Also he questioned the wisdom of spending so much money on work in Egypt and in Malta intended for a possible airship line to Egypt, and suggested that the money would be better spent at Croydon.

## 'Satiable Curtiosity.

Like Mr. Kipling's Baby Elephant, Mr. Raper is full of "'satiable curtiosity," and wanted to know what the Royal Aircraft Establishment did for its £364,000, and what the Royal Airship Works at Cardington produced for £140,000. On this latter Vote he pointed out that the R.A.E. can scarcely expect to get a first-class designer at £600 a year. Also he wanted to know who paid for the aeronautical experimental work at the National Physical Laboratory at Teddington.

He wound up by saying that his comments had not been made in a hostile manner, but solely to assist a splendid Service. Certainly no other Member gave evidence of having paid the same attention to detail in the Estimates as did Mr. Raper.

## An Ill-informed Critic.

**Mr. Mosley** suggested that officers and men of the R.A.F. might very well go on living in huts till the cost of building diminished and that the money thus saved might be devoted to Civil Aviation and Research. This is indeed a counsel of perfection.

How little Mr. Mosley really knows is shown by the fact that he urged a reduction in the military establishment of the R.A.F., and this in spite of the fact that he himself pointed out that money ear-marked for research last year had to be spent on creating five new squadrons needed for the various wars in which this country is still engaged.

Mr. Mosley also demonstrated his ignorance by insisting that pilots who fly commercial machines would be suitable for bombing and reconnaissance machines.

**Mr. Raper,** intervening, reminded the House that war experience showed that many of the best civilian pilots were unsuitable overseas, though they did good work behind the lines.

**Mr. Mosley,** one fears, suffers from an English conscience, for he retorted, "We are all, I hope, temperamentally unsuited to fighting." The recent rush to rejoin the Army and the Air Force hardly bears out his hope, nor does the behaviour of the majority of the Englishmen now in Ireland.

Mr. Mosley also delivered himself of the aged fallacy that "Men of science may end warfare by adding so immensely to its horrors that war will become impossible for the world." He happily forgot that other men of science of equal ability continue to devise antidotes which in fact make war increasingly possible, not to say probable.

After pleading for expenditure on Civil Aviation at the expense of Military Aviation Mr. Mosley proceeded to complain, on the authority of the Auditor-General, that £25,000 had been spent on the Cairo-Cape Town Air Route, which was essentially an effort to aid Civil Aviation. Truly these Members of Parliament are hopelessly illogical. Mr. Mosley may be a very clever young man in some ways, but he certainly ought to avoid Debates on the Air Estimates.

## The Compleat Airman.

**Captain Wedgewood Benn** objected to obsolescent services (presumably the Navy and Army) being still represented in the Cabinet when a real dominant service of the future is excluded from its councils. He said that air fighting is absolutely in its infancy and that the accessories thereto must be developed. At the same time he insisted on regarding civil aviation as a good training for war pilots. Incidentally at one moment the exactitude of his R.A.F. phraseology brought the House to a sudden realisation of the fact that Hansard alone is capable of printing what is evidently considered to be strictly Parliamentary language.

Referring to commercial aviation he wanted to know whether the Government intended to make parachutes compulsory on passenger machines. One believes that he would have done better to have insisted on the necessity for proper flotation gear on passenger machines and for the provision of emergency exits. Some of the present cross-Channel machines will prove to be absolute death-traps if they come down in the water.

Captain Benn drew attention to the fact that the five air stations built in Egypt are all in the Canal Zone and wanted to know why. One suggests that it is simply because if Egypt is to be an independent country we cannot have R.A.F. stations in it and so must have them in the Canal Zone which remains our property. Also, it will be observed, the Canal

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Zone is better situated for the building of aerodromes than is Palestine, and is, in fact, nearer to Jerusalem than any similarly suitable place. This, of course, will be useful when the returned Zionists rule the Earth from Jerusalem.

Captain Benn was unable to understand the idea of devising an Air Force on a Territorial basis. In one of his intelligence this lack of understanding is amazing. Surely nothing can encourage efficiency in the second reserve line of the Air Force so much as organising it on a territorial basis and thus instilling a spirit of local patriotism and emulation between squadron and squadron.

### The Navy's View.

**Captain Viscount Curzon** very naturally and rightly expressed his disappointment at the lack of any reference to the Naval side of the Air Force. He said that the Navy has always been suspicious of the arrangements which placed its air service under the Air Ministry. He said that there should be more co-operation between the Air Ministry and the Admiralty than in the past. He referred to a statement, which appeared in The Aeroplane alone, that the very few pilots who are capable of deck flying had recently been ordered to the Middle East. He lamented the turning down of airships.

**Lieut.-Commder. Kenworthy** supported the Air Ministry on "getting rid of these great gas bags," and said that they were only a temporary success because the aeroplane engine was in a state of development. He also protested against the Air Minister not being in the Cabinet in view of the fact that he is legally "one of His Majesty's principal Secretaries of State."

He enquired whether there had been any communication with the overseas Dominions with regard to their air services, and especially whether the Australian Commonwealth was to start air stations in its northern territory. (Who said, Japan?)

The same note cropped up in his complaint that no preparations were being made to establish an adequate air station at Singapore. He hoped that flying would do away with war by obliterating frontiers and making war terrible, but if we were going to spend eighteen million pounds or so on military aviation we ought to prepare to fight in those areas where we are likely to have to fight for the defence of our possessions, Empire and trade. He wanted to know why we seemed to be preparing for a Mediterranean war when any possible war must be in the Pacific or Atlantic.

He also appealed for greater subsidies for civil aviation.

**Commander Bellairs,** referring to a rumoured policy of secrecy at the Air Ministry, pointed out that in the Navy the greatest progress had always been associated with the most open discussion and the least secrecy and that the moment the Navy took to secrecy it fell behind. He advocated placing the Navy, the Army and the Air Force under one Minister of Defence so that the staffs should learn to co-operate.

**Mr. Bartley Denniss** spoke in favour of "airplanes," parachutes and air-mails.

### THE REPLY ON THE DEBATE.

**Captain Guest,** replying, said that the Air Ministry might have to destroy our airship fleet if nobody came along to run the ships commercially, unless the House was prepared to pay the enormous costs of personnel, housing and maintenance.

Replying to Mr. Baldwin Raper he said that Milton was retained because so much money has already been spent there. As regards the existing cross-Channel air lines, he said that two machines have so far been hired to the companies for the services and that a third would shortly be added. The charge for the hire is included in the operating costs of the service. The suggestion that fines should be levied for irregularity of service would be considered.

He stated that experiment and research work was making excellent progress.

He said that there are thirty-two Squadrons in the Royal Air Force: three in Ireland, three co-operating with the Navy, one giving refresher courses, three forming, six in Palestine and one forming there. Five in Mesopotamia, one on the way there from India, seven in India, one on the Rhine and one at Malta.

He confessed himself unable to form an opinion as to the value of commercial pilots to the Air Force and said that he would ponder upon the opinions of hon. members.

Also he promised to look into the matter of deck-flying, and he promised to deal with the Air Forces of the Overseas Dominions when the "Colonial Premiers" arrive in this country a few weeks hence.

He said that economy was the reason for there being no air stations at Singapore or in the West Indies.

He said that six types of parachutes are under experiment at Martlesham. He hoped that the existing cross-Channel service would, by regularity and punctuality, persuade the Postmaster-General to use air services regularly.

**Sir William Joynson Hicks** intervened, before the question was put, to protest against the absence of the Colonial Secretary, Mr. Winston Churchill, who had been to Egypt investigating the position accompanied by the Chief of the Air Staff, and had promised to take part in this debate.

Captain Guest replied that Mr. Churchill had suggested that he could make a more valuable contribution on the debate on the Colonial Vote than he could on that afternoon.

**Lieut.-Commdr. Kenworthy** pointed out the folly of compelling air traffic trading between his constituency (Hull) and Holland to go round by Croydon for Customs examination.

**Captain Guest** said that he would investigate the question.

**Captain Benn** suggested that the Estimates should include a vote for camouflage and said that this work should be done, not by the Royal Engineers, but by people whose natural habitat is the air. Personally one's own experience is that the only effect of camouflage on air stations in this country is to make the sheds more conspicuous. As Captain Benn pointed out, shadow is much more effective as camouflage than paint.

**Captain Guest** said that at present the Air Force and the War Office co-operate in the camouflage department.

One can only end these remarks by hoping that Captain Guest's very plain and straightforward answers indicate that in his Parliamentary work he will not indulge in camouflage as did certain of those who preceded him, before and during the war, in the handling of Air questions in the House.

C. G. G.

## THE MONACO MEETING.

Apparently the Monaco Meeting this year was very much of a washout, partly owing to bad weather, partly owing to scarcity of machines, and partly owing to crashes putting machines out of action. Also it would appear that there is nothing new or strange among the competing machines.

The Aeroplane was fortunate in having as its correspondent at Monaco Miss Laura Oxenham, who was Assistant-Administrator W.R.A.F., at Felixstowe, and has an intimate knowledge of the manners and customs of seaplanes and their pilots.

Miss Oxenham writes:—"First of all it was to commence on Wednesday, April 13th, but we had had bad weather before and so the Motor-boat Meeting had not finished. On Thursday, the 14th, four machines belonging to the French Navy arrived from St. Raphael. About four o'clock on the 14th Roget went up in his Breguet to give an exhibition. It was quite interesting, only he crashed on landing and wrecked his machine. He had a passenger, Mr. Klairggal, from the Pathé Company, and a fox terrier. The latter was drowned. They afterwards found her dead body in the machine. I suppose the poor little thing was hurt, as she could swim very well. Roget and his passenger escaped but they lost their kinematograph, valued at 25,000 frs. Divers have been after it, but so far with no success. Of course that put Roget out of the meeting.

"On Friday there was 'a heaven' of a gale. Nothing doing, except about a quarter to seven in the evening Maddalena arrived from Sesto Calende in a Savoia. He was mad to try flying in such weather, but arrived safely, although he made my heart sink into my boots. It is only Italians who dare to fly like that.

"On Saturday a disgusting wind again, and away flew the four Naval aeroplanes, very fed up with the delay, I think. They have not put in another appearance, which I think very unsporting.

"Maicon went to Ajaccio (in the Monaco-Corsica-Monaco Competition) in all the wind. The papers seem to think he did wonders, I thought it quite ordinary.

"Sunday left us with Maddalena's Savoia, which refused to start for the race Cannes-Cap Martin because the propeller was sulky, two machines belonging to Lalouette (his own property), a 'Georges Lévy' Farman (not the 'bus that usually lives in the port, he has three altogether), and a Spad, and a Clergêt-engined Caudron piloted by Poiret, and a three-engined Caudron piloted by Maicon. It was a beastly cold day and the sea was quite disagreeable.

"The three-engined Caudron went for the altitude test about three o'clock (she's too heavy, I suppose for racing).

"The small Caudron was the only machine to fly to Cannes and Cap Martin, and even then skipped the course, and had to do it all over again. Of course he won the prize! (I got a prize like that once!)

"Lalouette smashed a float in his Spad about one o'clock, and his Maurice Farman G.L. would not rise in the choppy sea (they must have got jolly wet) and the Savoia's propeller refused to work.

"Janello was due in a Savoia biplane, but no one knew where he was.

(Continued on page 404.)

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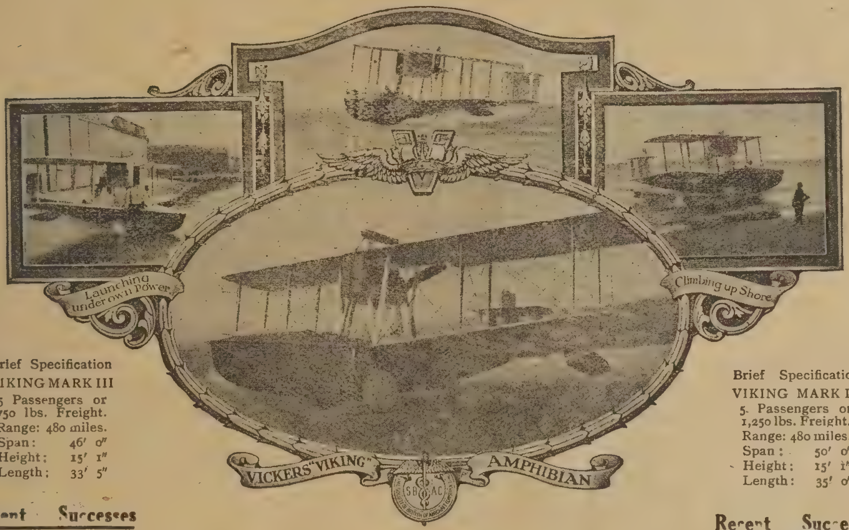

Brief Specification
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Length: 33′ 5″

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The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

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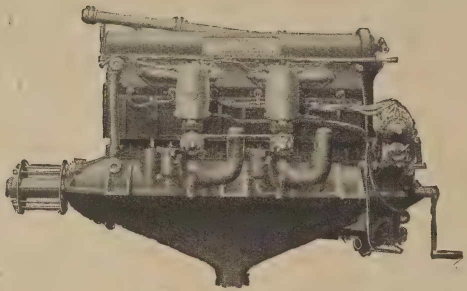

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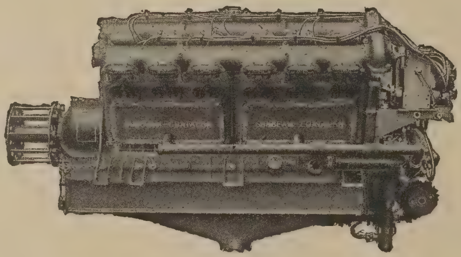

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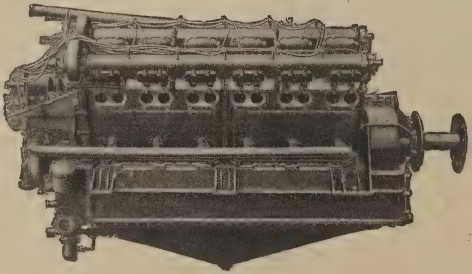
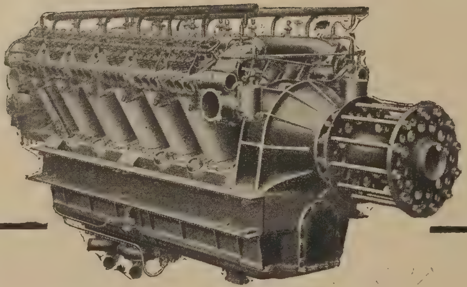


**"MATABELE" 420 h.p.**

An engine of similar design to that of the "Manitou," but of considerably greater power. It has been successfully adapted to motor boat work, as its performance at Monaco and Cowes in 1920 unmistakably showed.



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# AERONAUTICAL ENGINEERING

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## THE WEEKLY COMMENTARY.

In an article entitled "Science and Sense" an attempt is made to account for the mutual contempt which exists between practical men and scientists. It is shown by examples—sometimes aeronautical—that the main cause is a lack of mutual comprehension.

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Two interesting American aeroplanes are described in this issue. One is a minute single-seater, which is designed apparently for aerial dispatch-riding purposes. The other is a large and very heavily armed and armoured "ground-strafer," or contour fighter. Both are designed by the Engineering Division of the United States Air Service (page 396).

An account is given in this issue of the very interesting and apparently successful experiments on a captive helicopter which were carried out in Austria towards the end of the war. At the least these experiments seem to have broken by a large margin the previous height record for machines of this type (page 398).

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A description of the wind tunnel equipment at the Junkers works at Dessau records a notable effort to place the testing of aerofoils on a quantity production basis. (Page 400.)

## SCIENCE AND SENSE.

The Wilbur Wright lecture by Mr. G. I. Taylor, which was reported at some length in the previous issue of this paper, should, in some measure, serve to dispel some very common misconceptions which are prevalent amongst those who do not profess to be scientists.

There is a very numerous class of persons who would label as "scientific" any statement or thesis which is beyond their comprehension. The illegible prescription which they bear from their local quack's residence to their local drug-mongers' warehouse in order to obtain an adequate supply of anti-bilious doses is to them as much a "scientific" work as is Professor Bryan's investigation into the stability of aeroplanes.

It is very largely this incapacity to appreciate the very wide range which is covered by Science, and the lumping together of everything not understood under that comprehensive head, which leads to the development of a "crimson aura" by numbers of otherwise estimable persons when the name of Science is called upon in their hearing.

Mr. Taylor's lecture demonstrated in exceptionally lucid terms how researches into abstract and abstruse problems, carried on mainly from motives of curiosity, may, and very often do, lead to results of very great practical importance to the world at large. There are very many people to-day who will admit the claim of the pure scientist that abstruse researches are justified, not because any immediate cash returns can be foreseen as the result of those researches, but because by contributing to the sum of human knowledge they may eventually increase man's control over the forces of nature.

Yet there are many such who, despite this admission, hold that when the scientist descends from these abstract realms and attempts to apply scientific methods to the solution of practical, every-day problems, he becomes an intolerable nuisance.

### OF BOLSHEVISM IN HIGH PLACES.

There is even a suspicion that the Editor of this paper is secretly disappointed at the postponement of a recently threatened revolution, because he had hoped for an opportunity to organise the looting of the N.P.L. Yet this same Editor has never been heard to speak disrespectfully of Dr. Einstein.

The question arises, therefore, as to the real cause of this very noticeable antagonism between the "practical" man and the scientist who tries to deal with practical problems by scientific methods. The real answer to this question is that it is due to a lack of education—on both sides.

The practical man lacks the education to follow the scientist's reasoning, consequently he fails to realise to what extent the scientist's conclusions are based on definite, but often limited and incomplete, assumptions or data. He does not realise to how different a conclusion that same reasoning will lead it if it were applied to complete and correct data.

The scientist lacks the knowledge of practical affairs which would indicate to him the commercial, or the practical, importance of conditions which—from the point of view of the physicist or the chemist alone—are of little interest. He omits them from his assumptions and attains a result, accurate enough in its way, but useless to the practical man.

### A DIFFERENCE OF LANGUAGE.

Neither of them speaks the other's language fluently, they fail entirely to understand what result each has been seeking, and they part in an atmosphere of mutual contempt. On the whole the scientist is the more to blame, because if he is a scientist at all he must be a reasonable creature, whereas—as most practical men will admit—very few other practical men are. Therefore the scientist might be expected to make an effort to discover what the practical man wants—and very often he doesn't.

It has to be admitted, however, that the miserable scientist is in a somewhat difficult position. One may illustrate his case by the very extreme case of imagining this country possessed of a Prime Minister who applied scientific methods to political problems.

### MATHEMATICAL METHODS OF SETTLING STRIKES.

Faced by a demand for a National Pool for the equalisation of wages in the road-sweeping industry, such a Premier might have said : "A pool in its most obvious and complete form would involve Government control of all those local authorities who are charged with the cleansing of highways. Such control is obviously impossible. It would remove the incentive—which competition between various districts now provides—to the more efficient operations of this industry, and would bring Bayswater Road down to the level of Stamford Bridge after a cup-tie final. On the other hand, I can conceive of a sort of a pool set up by co-operation between the various districts, which would involve no Government control, would but very slightly affect the existing incentive to the efficient working of road sweepers, but which might have but little effect on the equalisation of wages."

"I have not the slightest doubt that this House will agree with me that this is a question every avenue of which should be accurately explored, and I therefore, in the name of the Government, invite the two parties to this unfortunate dispute to discuss the question in the presence of the President of the Government Department of Mathematics."

"When all the available data have been obtained this official (P.G.D.M.) will construct the necessary differential equations and will solve for the condition of maximum all-round efficiency in the industry concerned."

### THE PRACTICAL METHOD OF PROLONGING STRIFE.

Now a Government with such a head would not for long command a majority in any yet conceivable House of Commons. Yet this attitude towards an industrial dispute is one much more likely to lead to a sound solution than Mr. Lloyd George's actual attitude, which is that a "Pool" is a Pool, that a Pool is an evil thing, that therefore it can't be considered, although the real problem calling for solution is: How bad is the best conceivable type of pool, and is it really any worse than other conditions which must exist in the absence of a pool?

The scientific attitude is impracticable not because there is anything wrong with the attitude, but because neither the practical men, nor the mathematical men, know enough about either economics or mathematics to translate a problem in complex applied economics into the language of mathematics.

### APPLIED AERONAUTICS AND SCIENCE.

This is, in a slightly less extreme form, the state of affairs in many branches of applied science. It is particularly the case in aeronautics. In the case of aeronautics there are possibilities of a general extension of knowledge to such an extent that the practical aeronautical engineer will be able to state most of his problems in terms amenable to accurate mathematical treatment and that the mathematician will be able to understand that statement and supply the practical engineer with a sound solution of those problems.

This will occur long before the mathematically minded Prime Minister becomes possible, but it will only occur if the practical man and the scientist will take the trouble to try and understand each others difficulties, and acquire at least a smattering of each other's language.

### A SCIENTIST ON BANKED TURNS.

Perhaps one may illustrate by a case in point. A letter has just been received in this office enquiring "What keeps an aeroplane in the air on a vertical bank?" Before answering this question it was thought worth while to consult what is generally admitted to be a standard work on "Applied Aerodynamics." Under the heading, "Turning in a horizontal circle without side slipping," one discovers a series of equations defining the motions of an aeroplane under these conditions. Further on one reads 'A vertical bank, which gives an infinite value to tan $\phi$ is not within the limits of steady motion, and can only be one phase of a changing motion."

Later still the lift on the wings in a banked turn is shown to be greater than during normal flight, and an expression is given for this increased lift. This expression indicates that on a turn at 85 deg. bank the load on the wings would be over 11 times the normal loading, and it can be inferred that the pilot would sit on his seat eleven times as hard as usual.

Still later a second heading—"Spiral Descent"—is found. This ends in a table of spirals and spins, which show that a spiral with an angle of bank of nearly 84 deg. is possible, but that the angle of descent is then 80 deg., and that the radius of turn is 6 ft. and the air speed is 99 ft. per second.

### WHAT EVERY PILOT KNOWS.

Now every pilot, and very many other people, know that an aeroplane in practice can get to a bank of very nearly 90 deg., and that it can do this on a radius much greater than 6 ft., and that it need not descend during that bank at any angle approaching 80 deg. It is also known that neither the wings nor the pilot collapse if such a manœuvre is carried out.

This would appear to a majority of "practical" men to be adequate proof that the mathematical treatment given to this problem is merely nonsense. As a matter of fact it is not nonsense, but it is perfectly accurate within the limits of the assumptions made.

These assumptions do not cover the case of any real aeroplane, but only of an elementary aeroplane consisting of horizontal surfaces (wings and tail) and an airscrew. The case of the horizontal turn without side slipping does not cover the practical manœuvre, because in practice the turn is either not horizontal, or side slipping occurs.

### HOW THE DIFFERENCE CAN BE SQUARED.

The practical case is a special case of a special aeroplane which has vertical as well as horizontal surfaces, making a special type of spiral descent, probably with some side slipping.

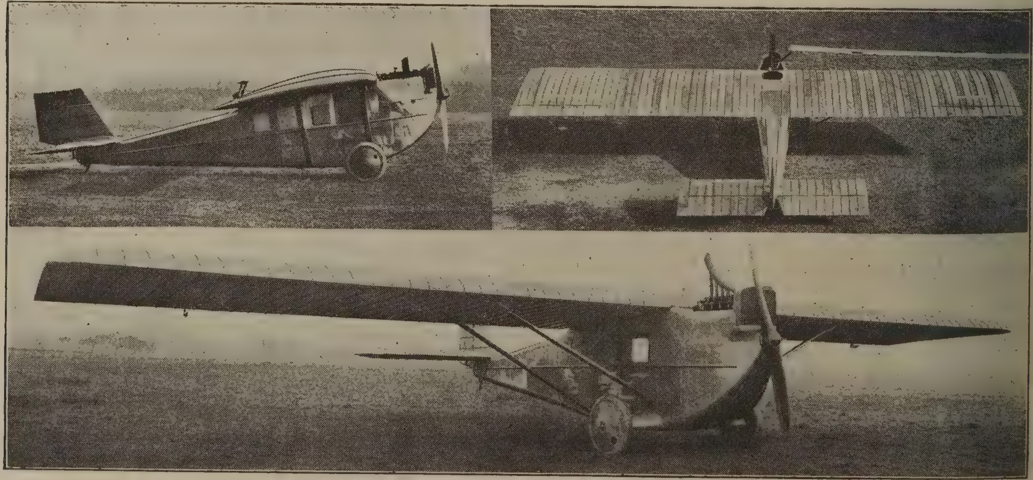
In this case the (normally) vertical surfaces act as lifting surfaces to some considerable extent, all sorts of curious odds and ends about the machine add to this lift a vertical component of resistance caused by the fact that the machine is slipping downwards, and, if one takes the trouble to estimate roughly the effect of all these factors—neglected in the general treatment of the elementary simple type of aeroplane—one discovers that a vertical bank can be held on a quite large radius, with only a very slight rate of fall and without any enormous load being thrown on either the wings or the pilot.

There is nothing wrong with the mathematical treatment, and there is nothing in the facts of which the author of this particular work is likely to be unaware. Any reader of the book who really understood that book, and also had a practical knowledge of aeroplanes in being, should be able to produce from the data contained in the book in question a fairly close estimate of the possible path of any particular real aeroplane which would square fairly closely with observed facts.

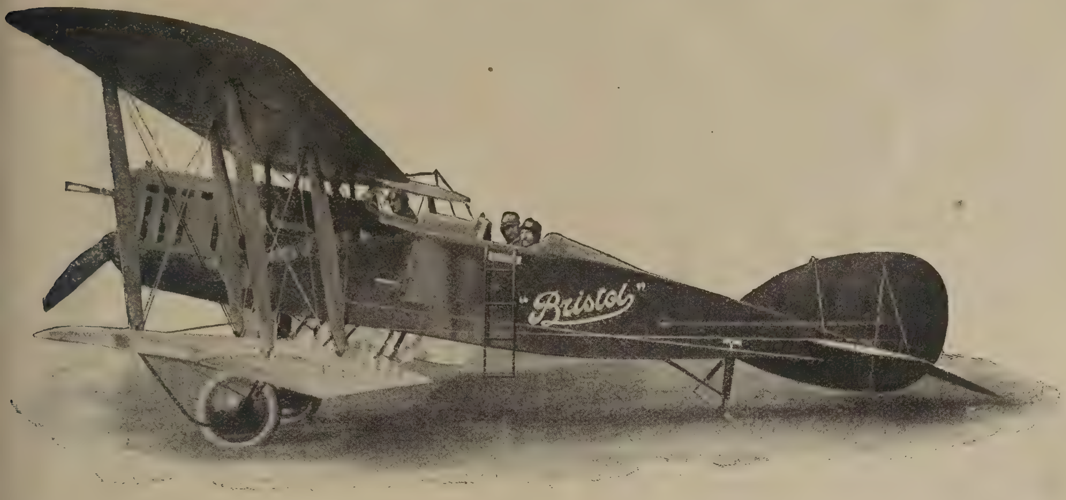
### HOW IT IS OFTEN EXAGGERATED.

But unfortunately there are certain people who can read and more or less understand a work of this type, and yet know so little about real aeroplanes that they would maintain that the deductions as to the imaginary elementary aeroplane are strictly true of the real aeroplane. On the other hand, those who know what the real aeroplane can do, do not understand the mathematical aspect sufficiently to see what essential factors of the practical case have been neglected in the mathematical treatment of a simplified example.

Hence one will find mathematically minded students of aviation firmly convinced that all pilots are liars of the most confirmed type, and pilots and other practicians of aviation convinced that mathematics is only a name for a special form of idiocy. The case is not really as bad as all this, but the practical effect of this attitude of the one class towards the other is nearly as bad as if their judgment of one another were just.—W. H. S.



**Three views of the Zeppelin Dornier seven-seater monoplane (185 h.p. B.M.W. engine) type Do C3, which was fully described in the issue for April 6th.**



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*The*
*"Bristol" Aeroplanes*

## THE SPERRY "MESSENGER."

The "Messenger" was designed by Mr. Verville of the Engineering Division of the U.S. Air Service at McCook Field with a view to substituting it for motor-cycles for certain messenger duties and also possibly for training purposes.

It has been built by the Lawrence Sperry Aircraft Co., Inc., Farmingdale, L.I., N.Y. It is a small single-seater tractor biplane fited with a 60-h.p. 3-cylinder radial air-cooled engine.

The fuselage is built up of four longerons with the usual cross bracing, and is covered with three-ply mahogany veneer. The engine is very neatly cowled in, leaving only the cylinders exposed to the air.

The wings are of the rigid truss variety, one set of N-type interplane struts being mounted on either side of the fuselage. There is but one lift wire running from the rear leg of the N interplane strut to the rear member of the Vee undercarriage directly over the front spar of the lower main plane, the other lift wires being replaced by round steel tubes streamlined with balsa wood. The wings are all alike, and are interchangeable, together with the ailerons, which are interconnected by a thin strut. The whole wing truss has been designed with a view to ease of erection and interchangeability.

The wing construction follows usual practice. The wing spars are of channelled spruce, the ribs being built up of mahogany webs with spruce cap strips. The wings were sand-tested at McCook Field and gave a factor of safety of 7 for normal flight, and 4 for inverted flight

The pilot's cockpit is very roomy, and the rear seat cushion is so arranged that it may be taken out and replaced by a pack parachute.

The engine is supported by two steel plates, one on either side, and these are in turn bolted to a veneer bearer plate on the nose of the fuselage. The petrol tank is built in two compartments, the lower or main tank carrying 6.7 gallons, and the upper or auxiliary tank 3.3 gallons, the whole being sufficient for two hours' flight.

Lieut. C. C. Moseley, the winner of the 1920 Pulitzer Trophy, recently made a flight from Washington City to Langley Field in the "Messenger," and the following account of his journey is culled from the U.S. Air Service News Letter, and given without translation :—

"To attend the opening of the new Officers' Club at Langley Field, I flew down from Washington in the 3-cylinder, 60 h.p., air-cooled Lawrence motored 'Messenger,' traveling at an altitude of, approximately, 600 ft. The little plane carries ten gallons of gasoline only, and not knowing the fuel consumption, I took along a 5 gallon can of gasoline in the rear seat.

"When about half way to Langley, I landed in a field and poured the extra gasoline into the tank. Some negro laborers were very much interested in the machine, and in my sudden appearance from the sky, but it took me more than a half hour to persuade them that the plane would neither kick nor fly away with them. After many questions and much laughter on their part, I finally induced some of them to hold the wings and tail of the machine while the motor was started. After that preliminary, it was only a matter of a few moments before a take-off was accomplished, as the propeller turns much more easily than a Ford is cranked.

"Had two forced landings after this due to cracked spark plug, but the size of the plane permits landing in even the very smallest fields. On the first of these I borrowed a monkey wrench from a negro workman, remedied the trouble and cleaned the spark plug. Then came a repetition of the performance of the first take-off with the new negroes that had gathered. Finally, however, I convinced them of their safety, and took off again with their assistance.

"The second forced landing came shortly after. I was flying over the Rappahannock River when the same cylinder cut out again; so I headed for shore, spending an anxious moment or two in so doing, as I had only about 500 ft. altitude, but safely made a little field on the bank of the river. Just as the wheels settled down, the dead cylinder coughed a couple of times throwing out a little black smoke, and then began hitting regularly, so that I took off and landed at Langley without any further experiences.

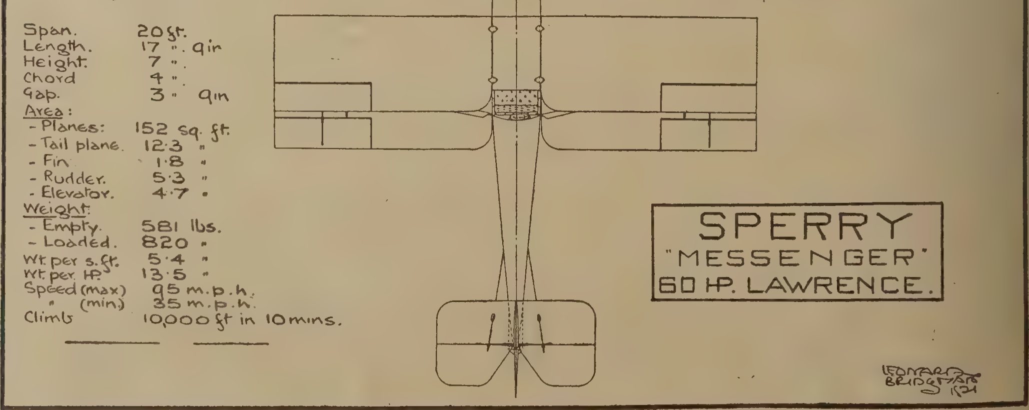
"I made the return from Langley a sort of exploration trip, flying at approximately 500 ft., and making several landings in good fields, and examining at close range the fishing smacks in the Potomac."

"The return from Langley to Washington, a distance of 138 miles, was made in 1 hr. and 45 min., using a fraction less than 7 gals. of gasoline and only 1 qt. of oil—which means about 25 miles to the gallon of gasoline—with all three of the cylinders 'put-putting' merrily and never a single miss."

## THE U.S. G.A.X. ARMOURED AEROPLANE.

The U.S. G.A.X. was designed by the Engineering Division of the U.S. Air Service as an armoured contour fighting aeroplane. A contract for ten of the type was let to the Boeing Airplane Co., of Seattle, Wash., and the first specimen is now ready to pass into service.

The machine is a twin-pusher triplane of more or less conventional design. The fuselage, which is short in relation to the span, is built up of four longerons with the usual cross-bracing and is covered, from the rear of the back gunner's cockpit to the rudder post, with three-ply. The forward section of the fuselage is armour-covered and contains a forward gunner's cockpit, the pilot's cockpit and the rear gunner's seat. The crew of three, a pilot and two gunners, are housed therein, and between them operate one 37 mm. cannon and eight Lewis guns. The 37 mm. cannon, four Lewis guns to fire forward and downward, and one Lewis gun firing upward and over the wing, are operated by the front gunner, and three Lewis guns, two firing downward to the rear through a tunnel in the fuselage, and one shooting upward and over the wings, are worked by the rear gunner. Accommodation is



| | |
|---|---|
| Span. | 20 ft. |
| Length. | 17 " . 9 in |
| Height. | 7 ". |
| Chord | 4 ". |
| Gap. | 3 " 9 in |
| Area: | |
| - Planes: | 152 sq. ft. |
| - Tail plane. | 12·3 " |
| - Fin | 1·8 " |
| - Rudder. | 5·3 " |
| - Elevator. | 4·7 " |
| Weight: | |
| - Empty. | 581 lbs. |
| - Loaded. | 820 " |
| Wt. per s. ft. | 5·4 " |
| Wt. per HP. | 13·5 " |
| Speed (max) | 95 m.p.h. |
| " (min.) | 35 m.p.h. |
| Climb | 10,000 ft in 10 mins. |

# SIR ROSS SMITH

**K.B.E., M.C., D.F.C., A.F.C.,**

the first to fly to Australia, says of the

# ROLLS-ROYCE AERO ENGINES

¶ "Undoubtedly we had **the best possible pair of engines,** and I offer my congratulations to Mr. Royce for designing those engines. They went through an extraordinary amount of bad weather, snow, rain and heat, and **never faltered once.** When we were speeding through deadly cold, nearly frozen and fed up, the only two happy things in the machine were those engines, **they purred along as if nothing mattered.**

"When we left Surabaya to start for Australia, we knew that ahead of us were 500 miles of open sea, and **the one thing that bucked me up was** that I happened to have this 'Vimy' with **two Rolls-Royce engines, which just two months before had flown across the wide sweep of the Atlantic,** and when I thought of what poor Alcock had gone through, our flight seemed only a joyride."

¶ "**The engines,** beyond the usual cleaning and adjusting, **had practically nothing done to them the whole time.** We would willingly, on reaching Port Darwin, have turned round and flown back."

¶ "We were so confident in the ability of the machine, that we simply went ahead in perfect confidence."

¶ **"A Rolls-Royce engine, properly looked after, would carry an aeroplane anywhere. The engines were the finest it was possible to have."**

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also provided for the carrying of bomb sights and a rack for ten bombs.

The tail unit is of the ordinary cruciform type, the elevators and rudders are of large area, and balanced.

The wings are of normal construction, and carry on the middle plane the two 400-h.p. Liberty engines, which are housed in armoured casings. This armour, with that on the fuselage, weighs approximately 2,000 lb. The interplane struts, of which there are two sets on either side, beyond the engine power eggs, are splayed out and are of the N type, those between the top and middle plane having the slanting leg of the N running downwards from rear to front, and those between the middle and bottom plane having the slanting member running downward from front to rear.

Ailerons are fitted to the top and middle planes only, the area of those on the top plane being 36.8 sq. ft. and those on the middle planes being 21.8 sq. ft., ten per cent. of each of which is balanced area. The ailerons are operated by wheel or Deperdussin-type control.

The undercarriage consists of two laminated spruce Vees, one under each engine. The axles consist of two steel tubes running from the undersurface of the fuselage to the two Vees. Two wheels are mounted on each axle, and are sprung on rubber shock absorber.

SPECIFICATION OF THE G.A.X. ARMOURED TRIPLANE.

| | |
|---|---|
| Span— | |
| Top plane | 65 ft. 6 in. |
| Lower planes | 58 ft. 6 in. |
| Length | 33 ft. 7 in. |
| Height | 14 ft. 3 in. |
| Chord— | |
| Top plane | 6 ft. 8 in. |
| Lower planes | 5 ft. 8 in. |
| Gap | 5 ft. |
| Dihedral— | |
| Top plane | Nil |
| Middle plane | 1.5 deg. |
| Bottom plane | 3.0 deg. |
| Area of planes | 1,016 sq. ft. |
| Area of ailerons (4) | 117.2 sq. ft. |
| Area of tail | 55.3 sq. ft. |
| Area of elevator | 36.4 sq. ft. |
| Area of rudder | 45.8 sq. ft. |
| Engines | Two 400-h.p. Liberty 12 |

| | |
|---|---|
| Weight (empty) | 7,532 lb. |
| Useful load | 2,208 lb. |
| Weight (fully loaded) | 9,740 lb. |
| Weight per h.p. | 11.2 lb. |
| Weight per sq. ft. | 9.6 lb. |
| Performance— | |
| Speed (low down) | 105 m.p.h. |
| Speed (at 6,000 ft.) | 99.5 m.p.h. |
| Speed (at 11,500 ft.) | 89.5 m.p.h. |
| Speed (minimum) | 63.6 m.p.h. |
| Landing speed | 50 m.p.h. |
| Service ceiling | 11,500 ft. |
| Climb to 6,000 ft. | 14.1 min. |
| Climb to 11,500 ft. | 36.1 min. |
| Rate of climb at 11,500 ft. | 100 ft. per min. |

## THE PETROCZY HELICOPTER.

The diagram and the photograph here reproduced are of a captive helicopter, due to Lt. Stefan von Petroczy of the Austrian Army Balloon Corps, which was built and tested during the war. The experimental work done was mainly carried out by Professor Karman. Laboratory tests on airscrews and tests on, first, elastic driven models, and later on a 30-k.g. model with a 5-h.p. compressed air engine, were made before any full-size work was attacked.

Two types of full-size machine were tested, one with a very light electric motor supplied with power through a cable, and the second with a machine driven by aircraft engines.

The electrically driven machine was abandoned, because although it lifted, the extremely light motor overheated and burnt out after half an hour's run. This machine empty weighed 650 kg.; the motor itself weighed 195 kg., and although intended to develop 225 h.p., it gave only 190 h.p. on the occasion of its breakdown. Nevertheless, it proved itself capable of lifting three men.

The petrol-engined machine gave more satisfactory results, and is that illustrated. It consists of a three-armed steel tube framework, each arm carrying one 120-h.p. Le Rhone engine, all three driving two oppositely rotating air-screw shafts through bevel gears. The airscrews are of approximately six metres diameter and rotate at about 600 r.p.m. at full speed.

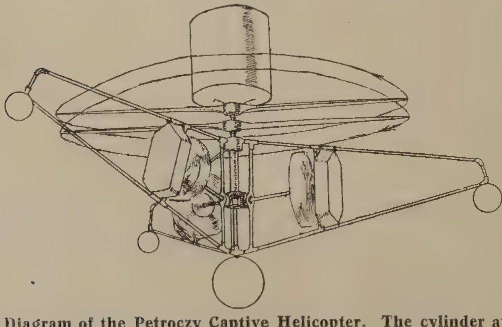
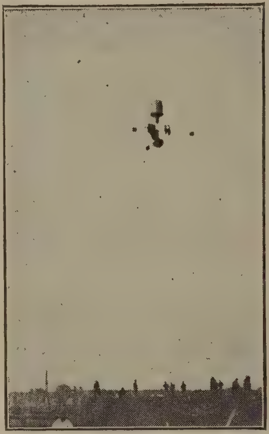


**Diagram of the Petroczy Captive Helicopter. The cylinder at the top provides the crew space.**



**A photograph of the Captive Helicopter in the air. Recollecting that the diameter of the airscrews is nearly 20 ft., and that the shock absorber balls at the end of the three arms are on a circle of still greater diameter, it will be obvious that the machine is at a height approaching 120 ft., which is considerably greater than has previously been authenticated in the case of a man-carrying helicopter.**

The circular objects at the end of each arm and the similar larger object under the centre of the frame are pneumatic buffers for landing.

Above the airscrews is a cylindrical turret for observer and gunner, supported by a central fixed shaft passing within the two hollow airscrew shafts to the gear-box casing.

In the observer's cockpit is stowed a large parachute of 250 sq. metres surface, and this parachute is mechanically ejected and caused to open, either at the observer's will, or by an automatic device if the airscrew revolutions drop below a safe figure. This parachute is sufficient to allow the whole machine to descend safely without aid from the airscrews.

The helicopter is attached at each of the three arms to one of three cables, and these cables pass round pulleys fixed on the ground at the angles of an equilateral triangle, and thence to a central winch.

As soon as the engines are turning at full speed, the winch is eased out, and the machine ascends. For descent the machine is hauled down by the winch. The work of the winch may be eased by throttling down, though up to the present the engines have always been run at full throttle.

The total weight of the apparatus, with fuel for one hour, but without crew or gun, is about 1,300 kg., and it is said that this weight can be reduced safely. The disposable lift developed at starting is given as 1,800 kg. Lift, stability, and endurance tests up to 1 hour low down were first made, and climbs up to 50 metres were made later. The excess lift is said to have been equivalent to the weight of four men, and steady soaring is claimed at 50 metres height in a wind of eight metres per second. (about 20 m.p.h.).

The fifteenth test flight was made at the request of the Official Commission surveying the tests, against the wishes of those responsible for the machine. The engines were in need of a thorough overhaul, and ceased to function with regularity. This led to violent oscillations, and the crew were frightened into leaving by parachute. The oscillations were particularly violent while the machine was being hauled down, and on reaching the earth the machine toppled over and damaged the airscrews.

It is stated that the experiments gave valuable information, particularly as to the position of centre of gravity relatively to the plane of the airscrews necessary for stability.

It is claimed that captive helicopters of this type have many advantages over the captive balloon for observational purposes. They are not such conspicuous objects, and so not such easy targets for artillery. They cannot be set on fire easily, and they give a good field of fire for defence against aircraft attack. Further, needing no gas, the field equipment for their operation is greatly reduced.

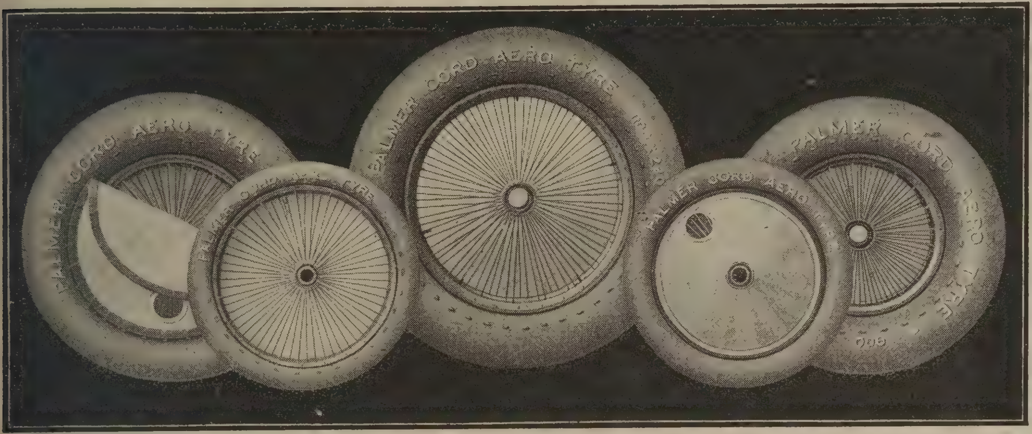
Dr. Professor Karman estimates that for such purposes the equipment of the ordinary balloon section can be reduced by four wagons and by 110 men if captive helicopters are substituted for the balloon.

It is somewhat interesting to observe that the above description is taken from one of the Technical Notes (No. 47) published by the American Advisory Committee for Aeronautics.

The note in question has been translated from a German account of the tests by American officials in Paris, transmitted to America, published, forwarded to this country, and it may be expected that in some months a second translation of the same matter will be issued by the Department of Information, the Air Ministry.

# PALMER

# LANDING WHEELS & TYRES



## STANDARD SIZES

| Tyre Sizes | Wheel No. | Hub | | Track Line |
|---|---|---|---|---|
| | | Length | Bore | |
| | | m/m | m/m | m/m |
| 300×60 | 16 | 111.12 | 25.4 | Central |
| " | 17 | 72.39 | 12.7 | Central |
| 450×60 | 30 | 89. | 31.75 | Central |
| " | 131 | 130. | 38.09 | Central |
| 575×60 | 21 | 160. | 28. | Central |
| " | 34 | 150. | 31.75 | 104/46 |
| " | 111 | 150. | 38.09 | 104/46 |
| 650×65 | 78 | 178. | 44.45 | 132'46 |
| " | 79 | 178. | 44.45 | Central |
| " | 100 | 178. | 38.09 | 132 46 |
| " | 101 | 178. | 31.75 | 132/46 |
| 600×75 | 21 | 160. | 28. | Central |
| " | 34 | 150. | 31.75 | 104/46 |
| " | 111 | 150. | 38.09 | 104/46 |
| 700×75 | 78 | 178. | 44.45 | 132/46 |
| " | 79 | 178. | 44.45 | Central |
| " | 100 | 178. | 38.09 | 132 46 |
| " | 101 | 178. | 31.75 | 132/46 |
| 700×100 | 77 | 178. | 44.45 | 1 32/46 |
| " | 92 | 185. | 55. | 1 35/50 |
| " | 95 | 185. | 55. | Central |
| " | 96 | 178. | 55. | 132/46 |
| " | 99 | 178. | 38.89 | 132/46 |
| " | 112 | 150. | 38.09 | Central |
| 650×125 | 119 | 178. | 55. | 132/46 |
| 750×125 | 77 | 178. | 44.45 | 132/46 |
| " | 92 | 185. | 55. | 135/50 |
| " | 95 | 185. | 55. | Central |
| " | 96 | 178. | 55. | 132/46 |
| " | 99 | 178. | 38.89 | 132/46 |
| " | 112 | 150. | 38.09 | Central |
| 800×150 | 82 | 185. | 55. | 135/50 |
| " | 85 | 185. | 55. | Central |
| " | *36 | 185. | 55. | 135/50 |
| " | *40 | 185. | 60.32 | 135/50 |
| " | 152 | 185. | 66.67 | 135/50 |
| 1000×150 | 131 | 220. | 66.67 | Central |
| " | 102 | 185. | 55. | 125/60 |
| 1000×150 | 141 | 250. | 80. | Central |
| " | 201 | 185. | 60.32 | 125/60 |
| " | 209 | 185. | 55. | Central |
| " | 210 | 185. | 60.32 | Central |
| 1000×180 | 148 | 220. | 80. | Central |
| " | 149 | 185. | 55. | Central |
| 900×200 | 107 | 185. | 55. | Central |
| " | 108 | 185. | 55. | 125/60 |
| " | 128 | 220. | 66.67 | Central |
| " | 137 | 250. | 80. | Central |
| " | 202 | 185. | 60.32 | Central |
| 1100×220 | 134 | 220. | 66.67 | Central |
| " | 136 | 250. | 80. | Central |
| 1250×250 | 133 | 250. | 80. | Central |
| 1500×300 | 115 | 304.8 | 101.6 | Central |
| " | 126 | 304.8 | 152.4 | Central |
| 1750×300 | 139 | 400. | 152.4 | Central |

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/KINJNU.

## WRATH.

The following letter has been received :—

Sir,—Your review of the current number of the *Aeronautical Journal* refers to the development of giant aeroplanes as there discussed, and makes a jovial reference to the present writer's "theories" on size limits, and to his supposed "wrath" if wicked "practical" designers knock them into a cocked hat.

May I point out that the basis of all such discussions is that most *"practical"* of all things a rigidly accurate physical relation which holds for all bodies and structures, namely, that for geometrically similar structures of the same material the weight increases as the cube of the dimensions, while the cross-sectional areas, and therefore the strength in tension or compression increases only as the square.

As examples from Nature compare the legs of the elephant with those of the pig, or the wing action [*Query*: "Section"? —Ed.] of an insect with that of a vulture.

In aeroplane construction the basis of all possible controversy lies in the possibility of getting away from similarity in large structures. The present writer holds that this possibility is limited, your reviewer perhaps is more optimistic. There is no controversy as to the effect of getting better wing shape or of using better materials, though any prophecy in the way of such improvements is large a matter of the prophet's personality.

To come to the point, if a designer can give a reliable estimate as to the extent he can save weight by departing from strict similarity to successful smaller aeroplanes, and a reliable estimate as to the improvement in his materials since his last design, then the writer will place a close limit on the size beyond which he cannot profitably go for any specified performance.

As there is some misapprehension as to the last phrase, it may be said that if the performance is one minute's flight on a perfectly calm day, without paying cargo, with no margin for the slightest bump on land or in the air, the limit indicated by present practice is about 200 tons total weight. If, however, paying cargo is 20 per cent. of the total weight, and ten hours' flight at 10,000 is required, then about 5 tons is probably the most economical size provided the factor of safety in steady flight does not fall below four. By cutting the factor of safety to 2 this figure may be increased to 20 tons, or thereabouts.

If on the basis of a successful aeroplane of 5 tons, a designer proceeds to lay out a 10 ton machine on the same lines without the guiding principle of similarity, he will either go round in a circle failing to reconcile his performance with his specification of strength, or he will tacitly or avowedly cut his factor of safety to meet his performance.

This latter was done by Hunsaker* in proceeding from a three-tonner to a twelve-tonner, and his naïve discovery that the factor of safety had at the same time fallen from six to three (as he says, "this sacrifice is necessary in order to avoid weight") is sufficient comment on his bold statement that there are no limits to size in flying-boats, an opinion voiced by Durand in his Wilbur Wright lecture.

Really your reviewer, if one may guess at his identity, is bound to be in substantial agreement with the writer; but there are so many variables in the general problem, that it is almost impossible to make any simple statement of it without implying a host of reservations which take effect with every change in the specified performance, and so careful an engineer as he is does not care to incur the responsibility of assenting to a numerical value of the limit which may be true and useful to-day as a guide, but which may require adjustment to possible revolutionary discoveries to-morrow.

(Signed) A. R. LOW.

### A SOFT ANSWER.

The paragraph to which Major Low's letter refers will be found on page 350 of THE AEROPLANE of April 13th. It stated that a certain fact was "no very certain confirmation of his" (the writer of the article on German giant aeroplanes) "theories which among other things are likely to arouse the wrath of Major A. R. Low."

Now there was no specific mention, in the note in this journal, of the theory of limits of aeroplane size, and certainly no reflection on the accuracy of the deductions from that theory.

There was an implied reference to the conclusions contained in the article on giant aircraft as to "limits," and if anything a hint that these conclusions were unjustified, and contrary to those held by Major Low, which is, if anything, a pronouncement in favour of Major Low.

At is appears that Major Low, before the appearance of the note in this journal, had already taken the author of the article to task on this particular subject, in a letter to *Engineering*, and as the note in THE AEROPLANE has produced the above letter, it is fairly obvious that the present writer's prediction as to "wrath" was accurate.

It may perhaps be as well to state here that one has no quarrel whatever with the theory of aeroplane dimensions as enunciated by Major Low. In the concluding paragraph of the above letter he has very fully admitted the justice of the grounds upon which one may differ from certain specific conclusions which he has drawn therefrom. Major Low has undoubtedly drawn those conclusions with a full consciousness of the reservations under which alone they are valid, but it has not always been made clear how extensive these reservations really are.

As a mater of fact every improvement in aircraft design, whether it be in aerodynamics, in structure, in materials of construction, or in the efficiency or the weight/power ratio of the power plant must modify these reservations and cause some alteration in the practical limits to the size of aircraft.

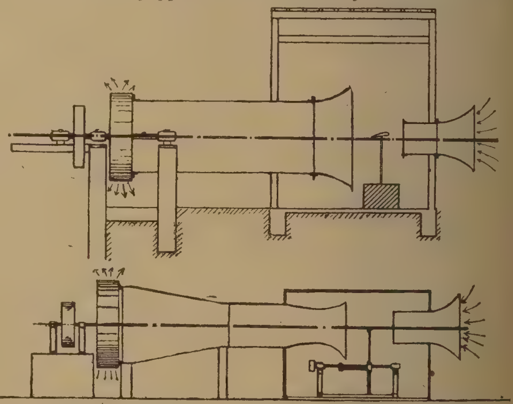
Major Low is apparently of opinion that progress in these matters is likely to be slow, and that the present limits of size will therefore increase but slowly. He is, of course, entitled to hold such an opinion, with the necessary result that —in his opinion—aircraft very much larger than those now in existence will not be practicable for some long time.

It requires to be made clear that this opinion is the result, not of the theory of aeroplane dimensions, but of Major Low's personal estimate of the probability of a rapid improvement in the technique of aeroplane design. That one may usefully employ the theory to estimate the limit of practical size of an aeroplane built to a fairly closely specified design is beyond debate.—W. H. S.

## THE JUNKERS AERODYNAMIC LABORATORIES.

The practical achievements of Prof. Junkers as a designer of aircraft possessing many novel aerodynamic features, must be fairly well known to all readers of THE AEROPLANE. Some notes as to the research equipment which he has used in his experimental work may therefore be of interest.

In this connection it has to be remembered that Prof. Junkers is one example of a case fairly common in Germany, but very rare in this country, in that he is a man possessed of a scientific training of a fairly high order, who is also the head of a successful engineering business. This business is in the main concerned with the production of large internal combustion engines for stationary purposes, and in the development of engines of that type Prof. Junkers made use of a well-equipped research laboratory at Aachen.



Diagrams of the Junkers Wind Tunnels. Above, the Aachen Installation. Below, that of Dessau.

When at the beginning of the war Prof. Junkers began to attack the problem of improving aircraft in earnest, he added to this laboratory a wind tunnel.

This first tunnel was in some respects a crude affair. It was generally of the Eiffel type—wherein the actual measurements are made in an open chamber in distinction to the British type wherein the tests are carried out in the parallel portion of the tunnel itself, and the forces acting on the model are transmitted to measuring instruments entirely outside that tunnel.

The diameter of the tunnel was 2 metres, the overall length 6 metres, and using an electric motor of 100 h.p. a wind speed of 35 metres (115 ft.) per sec. was obtained. The tunnel ends are in the open air, and it seems unlikely that the steadiness of flow in the tunnel can have been as great as desirable.

In June, 1915, a second tunnel was erected at the works at Dessau. This tunnel is of the same general type as the original, but it differs in several respects. The whole tunnel is within a containing building, which should improve the steadiness of the air flow.

Instead of a circular section, an irregular octagon section

---

* Journal Franklin Institute, 1920, p. 732.

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is used, the air stream being 1.2 metres wide by 0.9 metres high. A centrifugal fan, driven by a 100-h p. motor, is used and an air speed of 40 metres per sec. can be attained.

It is admitted that the steadiness of flow and the uniformity of the stream in this channel is inferior to that of other wind tunnels, but it is pointed out that the object of this tunnel is not scientific research, but practical comparison of wing forms and the like details to assist in the production of actual machines, and that a high order of accuracy can be sacrificed to other considerations.

For this reason the balance used for measuring forces on models has been designed on lines widely different to those used in other tunnels. It is an automatically recording balance which draws a chart of the forces acting on the model. The carriage from which the models are suspended is mounted on two cylindrical rods parallel to the air-stream, and is free to slide along it, subject to the extension of calibrated springs. To reduce the friction between carriage and the rods the latter are continuously rotated at high speeds.

The distance moved against the calibrated springs measures the drag on the model, and movement is transmitted by suitable links to a pencil which draws on a moving sheet a curve of drag forces. The model is carried from the carriage on a beam which can rock against a spring, and the movement of this beam measures the lift force, and this movement is similarly transmitted to a second pencil which records lift.

During the progress of a wing test, the wing is automatically rotated through a range of angles of attack at a known rate by a motor which winds up a wire attached to the trailing edge of the model, and at the same time rotates the drum on which the records of lift and drag are drawn by the two pencils. It is stated that by this method a complete test on a given wing model can be made in twenty minutes, as compared with many hours in tunnels of normal type.

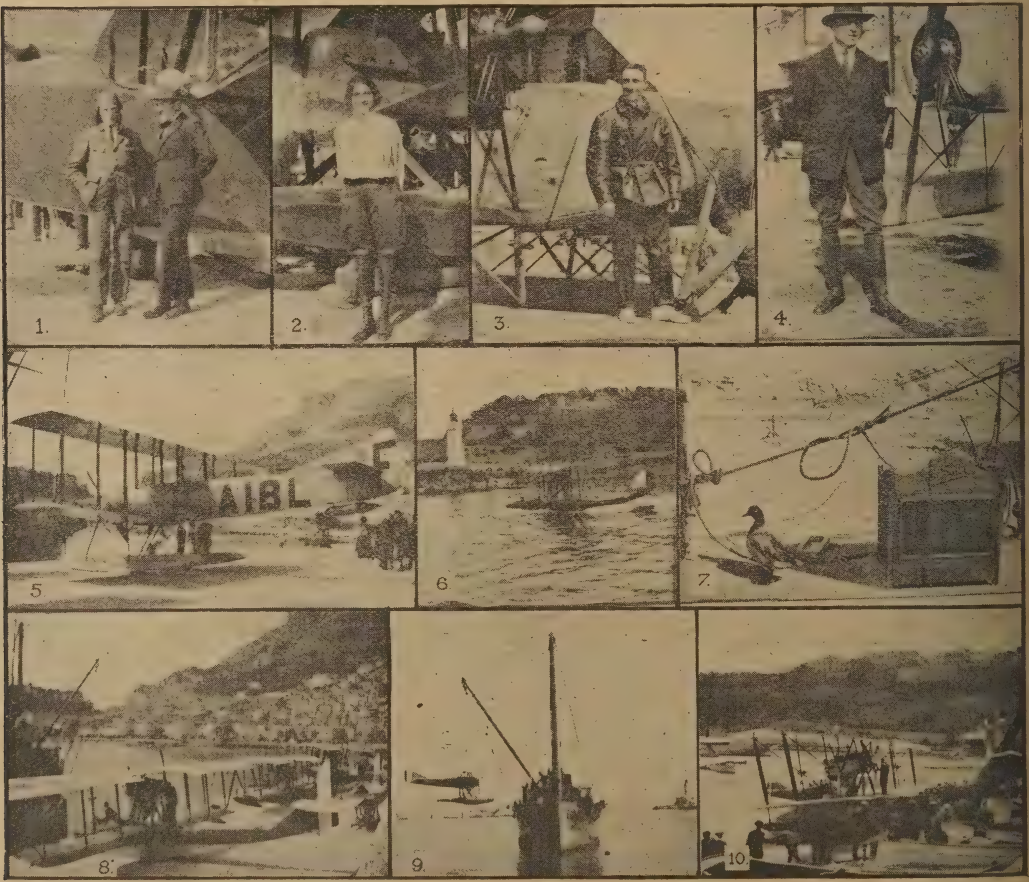
## TRIPLEX TROUBLES.

A circular sent to shareholders in the Triplex Safety Glass Co. invites support to obtain an investigation of the company's affairs and liquidation.

The Committee who are heading the agitation are Messrs John Varley, G. Wilmot-Buxton, and H. W. Birks. Shareholders are asked to address all communications to Mr. Frank Daphne, solicitor, 71, Lincoln's Inn Fields, W.C.2, who is acting as secretary to the Committee.

## THE LUST FOR SPEED.

According to *L'Air* for April 5th, France is still concerned with the problem of producing speed aeroplanes capable of defeating the existing world's speed records, the laws of resistance, and possibly the abilities of the best pilot to land on any aerodrome smaller than the Gobi Desert. It is stated that in a certain number of new monoplanes, possessed of engines of anything up to 600 h.p., thick wings, retractable undercarriages, and the absence of outside bracing, the constructors are hoping for a speed of 350 km.. per hour (218.75 m.p.h.), with a mere landing speed of anything over 200 km. (125 miles) per hour. The firms concerned are Nieuport, Spad, and Hanriot, and it is to be hoped that their efforts, at any rate to produce a really fast machine, will compel all the restful flies to remain settled on the speed record breakers of last year.



**AT THE MONACO MEETING.—(1) M. Lalouette and his mechanic beside his George Lévy Farman. (2) Madame Lalouette. (3) M. Maicon standing on one float of his Caudron. (4) M. Poiret in front of his small Caudron. (5) M. Poiret's Caudron. (6) M. Lalouette's George Lévy Farman. (7) M. Maicon's mascot duck and the "Villa Faibi." (8) General view of machines on the quay. (9) M. Lalouette's Spad with crevéed float being lifted onto the quay. N.B.—This is how most of the competitors' machines did their longest periods in the air. (10) Sig. Maddalena's Savoia on the beach.** *(Photographs by Miss Laura Oxenham.)*

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(*Continued from page* 390.)

"Maicon has a mascot, a duck, which he has in a little cage called 'Villa Faibi.' It seems such impertinence to expect a bird to fly with you in a cage.

"There is a Helicopter here. I believe it is not going to fly as the owner has promised his wife not to.

"Really it is a shame the Meeting is such a washout, as Monaco does its very good best. We had more warships than machines. Monaco does all in its power to encourage entries, the prizes are good, and arrangements well organised. This year they roped off the machines from the common herd.

"Lalouette had bad luck. He is a very deserving hard-working man. His Spad he bought in pieces, and he put it together himself with his wife's help. I was quite glad he only cracked a float after I heard that, as he might have cracked something more valuable. His missus is really a wonderful person. She had her leg broken in two places by an accident last year, but is quite the same as before. They are both very popular.

"Why do they hold the Aviation Meeting in April? It is the worst month here in the year, and weather is most important, such gales, rain, and the dust!"

From the local papers one gathers that Monsieur Lalouette's Spad has a 200 Hispano-Suiza engine and was assembled by him at St. Raphael. This machine is apparently intended purely for speed and acrobatic flying. His other machine, the George Lévy type Farman, has a 300-h.p. Renault.

Incidentally it may be of interest to note that this machine is a flying boat of the type built by the George Lévy firm, the head of which was a great banker of that name who has now retired from aviation, as has happened with so many of our British capitalists who made large profits out of war aviation. The works and the design and the goodwill of the name have been acquired by the Farman Company.

Of the Caudrons, the smaller F-AIBL has one Clergêt engine and is piloted by Poiret, the bigger Caudron (F-AIBI), has three Clergêts, and is, so far as one can learn, precisely the same machine as that which appeared without success last year. The Bréguet, piloted by Roget, which was smashed on the 14th, was of the 14 A.2 type with a Renault engine.

Monsieur Laurent d'Eynac, Under Secretary for Air in the French War Department, was at Monaco for the opening.

### THE END OF THE MEETING.

Miss Oxenham, writing on April 21st, says:—

"Only one machine left whole on the port—Poiret's Caudron. Since last I wrote the weather has not improved and the result was two Savoias and a Spad smashed, also yesterday Maicon came down and smashed near St. Raphael.

"I saw the Navy departing from my window this morning, three destroyers. So now all is once again quiet in the port and it is a glorious day!"

From local papers one learns that on the 18th Poiret, on the small Caudron, flew from Monaco to Cannes, back to Menton and thence to Monaco. There were no other competitors and so he won teh Speed-Prize

The same afternoon M. Laurent Eynac, the French Under Secretary for Air, went for a voyage with Maicon on the C.39 Caudron, complete with duck.

The usual banquet, given by the International Sporting Club, took place on the evening of the 18th. M. Laurent Eynac presided over some 200 guests.

On the 19th there was a strong East wind, and towards the end of the afternoon it rained. Maicon tried the San Remo-Cannes-twice-over competition. He covered the 284 kilometres with the wind mostly sideways in 2 hr. 25 min. 41 sec.

While Maicon was in the air Bologna tried to start for the same competition, but punctured the hull of his S.12 Savoia in starting. Lalouette also tried and broke another float.

In the afternoon there was an alleged speed competition over the same course as that covered by Maicon. Poiret covered the 284 kilometres in 2 hr. 5 min. 7 sec.

Also in the afternoon Maddalena arrived from Sesto Calende on a new Savoia. By way of ending his 400 kilometre non-stop flight with *éclat* Maddalena landed in the open sea in front of the Tir-aux-Pigeons instead of in the harbour, with the result that practically as soon as the machine landed a wave burst the hull. Maddalena and his mechanic were pulled out by motor boats. Maddalena was very much annoyed when on landing soaking wet after his wreck a Custom House officer came up to him and demanded what he had in his valise. There was very nearly a row over it.

On the 20th, the last day of the Meeting, Poiret, on his little Caudron, being then the only competitor with a machine which could fly, acquired the prize for the Speed Competition of 125 kilometres, which he covered in 44 min. 46 sec. Lalouette, having patched up his Spad, went for a height prize and reached 3,500 metres. On coming down he cracked both his floats and the machine was completely wrecked.

Maicon smashed his machine somewhere beyond d'Antibes. Apparently his motor stopped when he was flying at about 150 metres and the machine touched the water with the wing tip on alighting. Maicon and his mechanic were picked up off the tail of the machine by a motor-boat just before it went under.

Altogether the Meeting can be written down as a complete failure, and one can only hope that in the future the British Aircraft Industry may be sufficiently wealthy to send a few machines to Monaco and there show the assembled wealth and beauty of Europe what seaplanes can do when built to stand real sea and when handled by real sea-going pilots.—C. G. G.

## AERIAL ATTACKS ON WARSHIPS.

Many very exaggerated statements have appeared in various organs relating to experiments recently carried out to determine the effect of aerial bombs and torpedoes on armoured ships of war.

It has for instance been asserted that the American Air Service dropped bombs upon the ancient battleship *Indiana* and that in such dropping 41 per cent. of hits were scored from 6,000 ft., and that the ship was sunk by this attack. The facts are quite otherwise.

A target representing a battleship was laid out on earth, and dummy bombs to the number of over 100 were dropped from 6,000 ft.; 19 per cent. of actual hits were registered, and 41 per cent. were registered within what was *considered* a dangerous proximity to the target.

The tests on the *Indiana* were made by electrically exploding bombs placed in position relatively to the ship. One of these was of 1,800 lb., and was exploded on deck and did an enormous amount of damage to gun turrets and the like. The second of 880 lbs. was exploded in the water, about 40 ft. from the stern, and at a depth of about 50 ft. The explosion of this bomb caused much damage to the rudder and to the stern framing, and caused a leak which led to the ship settling on the mud. No live bombs were dropped by aeroplanes upon this ship.

A statement appears in one French journal that the ex-German Dreadnought *Baden* sank after a "little discussion" with certain British aircraft. As a matter of fact the Baden was sunk by gun-fire from a British monitor specially equipped with a turret mounting three guns of not less than 13.5 in. calibre in the course of tests of the new armour piercing projectiles used by the British Navy.

After having been so sunk and while she was lying on the mud with a heavy list, the *Baden* was torpedoed by a British aeroplane. No information whatever as to the damage caused by this attack has been published by the Admiralty, but she certainly did not sink as the result of any aerial attack.

## MORE JAPANESE ACQUISITIONS.

One learns that in addition to Shorts and Avros the Japanese Navy have recently ordered a number of Parnall "Panthers" and also some Nieuport "Night Hawks." The latter are being constructed by the Gloucestershire Aircraft Co., Ltd., who were making these machines for the Air Ministry to the Nieuport Co.'s designs at the termination of hostilities. The "Panther," it will be remembered, is a deck-flying machine designed to fold so as to facilitate storing on board ship, and the Nieuport "Night Hawk" is about the fastest single-seater land-going fighter of the day.

Also it is of interest to learn that Mr. Volkert, formerly chief of the Design Department of Handley Page Ltd., has been engaged by the Japanese Navy for their technical department. As Mr. Volkert was concerned with all the experimental work and putting into production in quantities of the twin-engined and four-engined Handley Page Bombers (Rolls-Royce engines), and with the design and experiments of the W.8 Handley Page (Napier engines) which won the Air Ministry Competition, it may be assumed that he knows most of what there is to know about producing long-range bombing machines.

It will be remembered that the long-range bombers were intended to start from England to bomb Berlin. It is hardly likely that machines would start from Japan to bomb San Francisco, but quite a good deal might be done by machines starting from a base in Western Mexico.

Altogether it is patent that the Japanese are very much in earnest about their Naval aviation programme.

## A NEW HANDLEY PAGE.

One learns that an entirely new Handley Page machine will shortly make its appearance at Cricklewood. It is a monoplane with a wooden plane with the H.P slot wing of the type called by the Heathen the "Rhinopteros" or "money wing."

It is fitted with a 350-h.p. Rolls-Royce engine and will carry ten or twelve passengers. Doubtless it is being hurried along in order to replace the relics of a bygone age which now revel in the name of air liners on the Handley Page portion of the London-Paris, 1921, air route.

It is expected that the "Rhinopteros" (as it will surely be christened) will be on test within a month or six weeks.

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## CONTENTS

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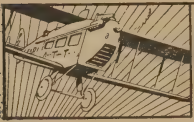

# COMMERCIAL AERONAUTICS
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### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine: next the ports of departure and destination: next the times of departure and arrival; next the cargo. whether goods (G) and/or mails (M): next the number of passengers: and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS:—B.C.—Bristol Aeroplane Company. F.R.—Franco-Roumanie G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L. Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes. M.W.—Marconi Wireless Telegraph Co. Ltd. N.L. Nordiska Luftrederi Aktiebolaget P.L. Petters Ltd. S.F. Surrey Flying Services. S.N. Syndicat National pour l'Etude des Transports Aeriens (S.N.E.T.A.).

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

APRIL 18th:

K.L., Fokker, H-NABM, London-A'dam, 10.20-15.45, G., 2, Duke.
I.L., DH18, G-EAUF, London-Paris, 12.51-15.10, G.M , 7, Chattaway.
M.A., Breguet, F-CMAK, London-Paris, 12.52-15 11, G., Nil, Le Men.
S.N., DH4, O-BADO, Brussels-London, 12.05-15.32, Nil, 2, Van Opstal.
S.N., DH9, O-BATA, Brussels-London, 12.18-15.05, G.M., 2, Wouters.
S.N., DH9, O-BELG, Brussels-London, 12.18-15.05, G., 2, Catta.
G.E., Goliath, F-FHMY, Paris-L'd'n, 13.00-15.53, G.M , 7, Labouchere & 1
K.L., Fokker, H-NABG, A'dam-London, 14.21-17.25, G.M., 2, Holmes.

APRIL 19th:

K.L., Fokker, H-NABN, London-Amsterdam, 10.15-14.25, G.M., 1, Olley.
G.E., Goliath, F FHMY, London-Paris, 12.50-15.10, G., 1, Labouchere & 1
S.N., DH9, O-BELG, London-Brussels, 13.15-15.57, Nil, Nil, Catta.
S.N., DH4, O-BADO, London-Brussels, 13.15-15.40, G.M., Nil, Van Opstal.
I.L., DH18, G-EAUF, Paris-London, 11.05-14.00, G., 7, Chattaway.
S.N., DH9, O-BEAU, Brussels,London, 11.47-14.45, G.M., 2, Sahnovsky.
M.A., Breguet, F-CMAG, Paris-London, 12.40-17.04, M., 3, Charpentier.
M.A., Breguet, F-CMAF, Paris-London, 12.45.15.40, G., 2, Briere.
K.L., Fokker, H-NABM, A'dam-London, 14.15-17.15, G.M., Nil, Duke.

APRIL 20th:

K.L., Fokker, H-NABM, London-A'dam, 10.22-14.12, G.M., Nil, Holmes.
M.A., Breguet, F CMAF, London-Paris, 12.41-15.10, G., Nil, Briere.
M.A., Breguet, F-CMAG, London-Paris, 12.42-15.05, Nil, 3, Charpentier.
I.L., Vimy, G-EASI, London-Paris, 12.45-15.07, G.M., 7, Powell.
S.N., DH9, O-BATA, London-Brussels, 12.47-15.17, Nil, 1, Wouters.
S.N., DH9, O-BEAU, London-Brussels, 12.48-1542, G.M., Nil, Sahnovsky.
S.N., DH4, O-BARI, Brussels-London, 12.02-15.00, G.M., 1, Delzenne.
G.E., Goliath, F-FHMU, Paris-London, 12.55-15.58, G.M., 7, Favreau & 1.
K.L., Fokker, H-NABH, A'dam-London- 14.12-17.47, G.M., Nil, Olley.

APRIL 21st:

K.L., Fokker, H.NABG, London-A'dam, 10.25-14.14, G.M., Nil, Duke.
G.E., Goliath, F-FHMU, London-Paris, 12 25-14.50, G , 2, Favreau & 1.
S.N., DH4, O-BARI, London-Brussels, 12.44-15.00, G.M., 2, Delzenne.
I.L., Vimy, G-EASI, Paris-London, 11.15-14.10, Nil, 5, Powell.
S.N., DH4, O-BADO, Brussels-London, 11.50-14.27, G.M., 1, Van Opstal.
M.A., Spad, F-CMAW, Paris-London, 12.41-16.47, M, 2, Malfanti.
M.A., Salmson, F-CMAE, Paris-London, 12.54-15.33, G., Nil, Le Sec.
G.E., Goliath, F-GEAC, Paris-London, 14.15-17.18, G., 7, Labouchere & 1
K.L., Fokker, H-NABM, A'dam-London, 14.00-17.28, G.M., Nil, Holmes.

APRIL 22nd:

I.L., DH18, G-EAUF, London-Paris, 12.29-14.45, G.M., 7, Powell
M.A., Salmson, F-CMAE, London-Paris, 12.23-14.50, G., Nil, ——
G.E., Goliath, F-FHMU, Paris-London, 12.45—, G.M., 9, ——
S.N., DH4, O-BADO, London-Brussels, 12.47-14.45, G.M., 2, ——
K.L., Fokker, H-NABH, London-A'dam, 10.06-13.37, G.M., 1, Olley.
G.E., Goliath, F-GEAC, London-Paris, 13.09-15.40, G., 2, ——
S.N., DH4, O-BARI, Brussels-London, 12.45-15.20, G.M., 2, ——
K.L., Fokker, H-NABH, A'dam-London, 14.47-18.12, G.M., 2, Holmes.

APRIL 23rd:

I.L., DH18, G-EAUF, Paris-London, 11.30-13.50, G.M., 8, Powell.
S.N., DH4, O-BARI, London-Brussels, 15.35-18.00, G., ——
B.C , Bristol, M-AAEA, London-Paris, 15.14-18.10, Nil, Nil, Forson.

APRIL 24th:

G.E., Goliath, F-FHMU, Ldn-Lympne 14.05 (23rd) Paris 14.45 G.M. 12 ——
K.L., Fokker, H-NABG, A'dam-London, 10.15-13.38, M., 2, Olley.

### Air Port Statistics.

CONTINENTAL

APRIL 18th:

H.P , HP, G-EATM, Paris-London, 11.25-15.25, Nil, 10, Perry & 1.

APRIL 19th:

H.P., HP, G-EATK London-Paris, 11.58-14.43, G.M. 9, Wilcockson & 1.
H.P , DH9, G-EAUI, Paris-London, —17.25, Nil, 1, McIntosh & 1.

APRIL 20th:

H.P., HP G-EATK, Paris-London, 11.15-14.45, Nil, 10, Wilcockson & 1.

APRIL 21st:

H.P., HP, G-EATM, London-Paris, 12.00-14.55, G.M , 9, McIntosh & 1.

APRIL 22nd:

H.P , HP, G-EATM, Paris-London, 11.25-14.45, G M., 11, McIntosh & 1.

APRIL 23rd:

H.P., HP, G-EATN, London-Paris, 12.00—, G.M., 9, McIntosh & 1.

### The London Terminal Aerodrome.

There are now half a dozen Bessoneaux portable hangars erected at Croydon. Two of these contain the remnants of what was once A.T. and T., and as the other sheds will all be absolutely full when Handley Page Transport arrive, they will all be required soon enough.

On Thursday night, while a more or less cheery evening was in progress in the Trust House lounge, a Handley Page came over from Biggin Hill to test the landing-lights and other signalling arrangements at Croydon. The Service crew were received with acclamation by the resident ex-Service pilots, and were presented, by way of a bouquet in recognition of their prowess, with one of the funereal-looking fir-trees which stand in tubs at the Trust House door, the tree being borrowed for the occasion without leave by the resident pilots. After a short stay the Biggin Hill crew, declining with all the virtue of the young man in "Excelsior" many pressing invitations to stay and have a convivial night, departed dutifully into the dark, accompanied by the tree, which, like some people's greatness, was thrust upon them rather than acquired or theirs by right of birth. On Sunday, however, the tree was back in its primordial tub, looking much merrier and brighter than its stay-at-home companion. Evidently fresh air and exercise are as good for young trees as they are for young officers.

Incidentally the landing lights are said to be sunk too deep in the ground. It is alleged that the crew of the H.P. likened them to ruby-tinted glow-worms.

Mr. Forson arrived on Friday with a new Bristol tourer M-AAEA, "Puma" engine, for a private owner in Madrid. He left Croydon in a storm on Saturday afternoon for Le Bourgêt *en route* for Madrid, where he will stay for a month or so teaching the owner to fly.

Mr. Uwins arrived on Sunday on a similar machine, M-AEAA, for the same customer. He reached Paris early this week, and the machine was to proceed thence with Mr. Forson as pilot.

The Bristol ten-seater, Napier "Lion" engine, is now incessantly expected. She is said to show a big advance in performance on other machines with the same power-plant. Evidently the design of purely commercial aircraft is progressing rapidly.

THE INSTONE AIRLINE.

The "Vimy" and D.H.18 G-EAUF were on the Paris route during the week piloted by Mr. Powell on two trips and Mr. Chattaway on one. Both the "18s" are being painted Royal Blue similar to the "Vimy" which, now that it is finished, looks very opulent, having the name on the front outlined with gold paint; also the windows.

Mr. Barnard was out testing the "Bat" on Thursday.

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The Westland has been christened the "City of Glasgow," and the B.A.T. is the "City of Newcastle." An unfortunate cat has been parading the aerodrome recently with the words 'City of Croydon" written on a label attached to its caudal appendage. A member of the I.A.L. named "Brown" is said to be the author of the outrage.

### The Surrey Flying Services.

On Saturday Mr. Muir was standing by all the morning to take a man to Southampton who had succumbed to the popular boat - missing - and - hoping - to - catch - by - air - and - again-missing epidemic. However, he appeared to be frightened of the weather, or the whether, and never arrived at Croydon. Mr. Muir was flying busily on Sunday as usual.

Mr. Muir has to go to Brighton shortly in his Avro for some photography and is willing to take a passenger for the return trip for the absurdly small fare of £3. Anyone wishing to go on the trip should communicate with Mr. Muir at Purley 1180 extension 16 as soon as possible, or with the Lep-aerial Travel Bureau Gerrard 4387. Similar flights can be arranged any time, preferably not at week ends, for £6 6s. for two people.

On Saturday afternoon Mr. Shaw, now of Basil S. Foster Ltd., was flying the S.F.S. Avro over the Association Cup Final with a photographer and oneself. The light was bad and for some time we watched the ground being well rained-on while we were in sunshine over Roehampton.

During half time we could clearly see the Guards' band marching round, and when play was resumed, we neared the ground keeping within gliding distance of several possible landing grounds. After the photographer had done his work we returned to Croydon in fairly good weather after an hour's flight. Mr. Shaw's flying was exemplary, in the public interests. He kept a good height and never at any time was actually over the ground itself.

Mr. Muir is arranging parachute demonstrations for Whitsun holidays and hopes to obtain a "Guardian Angel."

### The Leatherhead Aviation Services.

Mr. Hayns brought Mr. Knowles over on Saturday in the blue-nosed Avro. He carried several passengers during the afternoon and later returned to Leatherhead. He also took up a number of passengers on Sunday.

### The Flying Dutchman.

The Fokkers are going strong, Messrs. Duke, Holmes and Olley all bringing machines over during the week. The weather was very bad on Saturday, but Mr. Cyril Holmes started off to Holland, returning owing to his not being able to notice any visibility about.

Shortly after his return the rain came down in torrents and as the weather on the Holland route was getting worse, Mr. Leverton wisely decided to take advantage of the arrangement with the Batavia Ship Line before it was too late and sent the passengers and goods that way.

This seems a much wiser policy than the old method of keeping passengers in case it might eventually clear and then sending them back to town too late to get to their destination that day by ground and water methods.

Mr. Olley got in on Sunday evening so that there were then three Fokkers at Croydon. The weather was vile at Croydon, but Mr. Olley reported blue sky all the way from Amsterdam to Dunkirk.

Everyone is hoping that "Mr. Leverton's friend" will pay another visit to Croydon shortly.—G. D.

## Cricklewood.

During last week one paid a visit to Cricklewood Aerodrome. There is now a public enclosure similar to that at Croydon, only about four times as big. Besides the cars waiting for the incoming machine, it contained a small boy and his mother or nurse the day of one's visit.

Of course the whole place is on a much smaller scale than Croydon, and one misses the beautiful open country for forced landings which surrounds the latter.

While one was there Mr. McIntosh arrived from Paris on an O/400 with eleven passengers, including a baby of six months. Mr. McIntosh appeared to strike the baby as distinctly humorous

Mr. McIntosh told one that earlier in the week he had a very bad trip from Paris in a De Havilland, being caught in numerous storms and being compelled to land several times *en route*. At one time he lost sight of the ground for more than an hour.

During the afternoon Mr. Wilcockson tested an O/400 which Mr. McIntosh was taking to Paris the next day. It got off very well for so ancient a type with eleven up.

Mr. Hope until recently an H.P. pilot, but now back in the R.A.F., arrived from Henlow in a very ancient and untidy-looking "Vimy" bomber.

On Saturday Mr. McIntosh took a young woman, who is believed to be what is called a "film star," to Paris. In the *Sunday Pictorial* there appeared a picture of Mr. McIntosh helping the charming damsel into a Sidcote suit (as she intended to sit in the nose of the machine), and at the same time registering (as producers of films are said to say) much admiration.—G. D.

* * *

## R.A.F. CADET COLLEGE SPORTS.

The sports of the R.A.F. (Cadet) College were held at Cranwell on April 23rd. "B" Squadron won the Athletic Challenge Cup with 24 points to 20 points by "A" Squadron, and the Victor Ludorum was M. C. Hayter, who scored 12 points, J. G. Hawtry obtaining nine points. The results were :—

LONG JUMP.—E. B. Forster, 1; C. W. Gore, 2; F. E. Nuttall, 3. Distance, 18 ft. 9¾ in.

ONE MILE (Final Heat).—J. G. Hawtry, 1; S. G. Conolly, 2; R. Lewes, 3. Time, 4 min. 49 3-5 sec.

PUTTING THE WEIGHT.—N. Vintcent, 1; R. S. Spaight, 2; J. S. Newall, 3. Distance, 27 ft. 5 in.

THROWING THE CRICKET BALL.—M. C. Hayter, 1; A. K. Lewis, 2; C. W. Gore, 3. Distance, 85 yd. 10 in.

220 YARDS (Final Heat).—M. C. Hayter, 1; C. H. A. Stevens, 2; N. Carter, 3. Time, 24 1-5 sec.

HALF-MILE (Final Heat).—J. G. Hawtry, 1; S. G. Conolly, 2; R. Lewes, 3. Time, 2 min. 17 1-5 sec.

HIGH JUMP.—F. E. Nuttell, 1; E. B. Forster, 2. Height, 5 ft. 5in.

100 YARDS (Final Heat).—M. C. Hayter, 1; C. H. A. Stevens, 2; R. S. Spaight, 3. Time, 10 3-5 sec.

TWO MILES (Final Heat).—J. G. Hawtry, 1; N. C. Hayter-Hames, 2; R. Lewes, 3. Time, 11 min. 2 4-5 sec.

120 YARDS HURDLE (Final Heat).—C. W. Gore, 1; F. E. Nuttall, 2. Time, 19 sec.

440 YARDS (Final Heat).—M. C. Hayter, 1; C. H. A. Stevens, 2; R. Lindsay, 3. Time, 56 1-5 sec.

TUG OF WAR.—"A" Squadron beat "B" Squadron.

INTER-SQUADRON ONE MILE RELAY (440 yards, 880 yards, and 220 yards).—"A" Squadron 1. Time, 4 min. 6 1-5 sec.

OBSTACLE.—G. C. Gernard-Smith, 1; O. L. G. Bett, 2; E. B. Coventry, 3.

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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... *Back Cover*
Aircraft Disposal Co., Ltd., The ... 403
Arrol-Johnston, Ltd. ... *Front Cover*
Auster, Ltd. ... *Front Cover*
Beardmore Aero Engines, Ltd., The ... *Front Cover*
Bray, Gibb & Co., Ltd. ... 407
Bristol Aeroplane Co., Ltd. ... 395
Cunard Line ... 408
De Havilland Aircraft Co., Ltd., The ... 401
Fairey Aviation Co., Ltd., The ... 387
Firth, Thos., & Sons, Ltd. ... 403
Imray, Laurie, Norie & Wilson, Ltd. ... 408
Instone Air Line ... 404
McGregor, Gow, & Holland, Ltd. ... 405
Metal Airscrew Co., Ltd. ... *Front Cover*
Napier, D., & Son Ltd ... 389
Naylor Brothers (London), Ltd. ... 405
New Pegamoid, Ltd. ... 408
Nieuport and General Aircraft Co., Ltd. ... 401
Palmer Tyre, Ltd. ... 399
Roe, A. V., & Co., Ltd. ... *Inside Front Cover*
Rolls-Royce, Ltd. ... 397
Rubery, Owen & Co. ... *Back Cover*
Sankey, J. H., & Son, Ltd. ... 405
Sunbeam Motor Car Co., Ltd. ... 392
Supermarine Aviation Works, Ltd., The ... *Back Cover*
Titanine, Ltd. ... *Front Cover & Inside Back Cover*
Vickers, Ltd. ... 391

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# ON THE VULGARISATION OF AVIATION.

Coal strike or no coal strike it is quite time that something definite was done to stir up public interest in flying. It is always well to take the long view, though it is possible to take too long a view.

For example, when the Department of Civil Aviation proposes to spend £22,000 on a mooring mast in Egypt, and £10,000 on an aerial lighthouse in Egypt, and £10,000 on levelling an aerodrome in Malta, all for the benefit of a proposed airship line to Egypt which may come into operation some time after the end of the Japanese-American War, it is rather as if one regarded the Crystal Palace from Croydon Aerodrome with a telescope intended to inspect the Man in the Moon. It is in fact bringing distant things too close.

What is wanted is an outlook sufficiently far ahead to deal advantageously with coming events as they arrive. It will be time enough to equip the air route to Egypt when the London-Paris, London-Rome, London-Berlin, and London-Amsterdam routes are adequately equipped. And it will be time enough to equip them properly when the London Terminal Aerodrome at Croydon is properly equipped to deal adequately with the work which ought to be done there. Moreover, it will be time enough to equip the London Terminal Aerodrome properly when the people who ought to be concerning themselves with the progress of British Aviation begin to do their duty by arranging to use the said aerodrome as it should be used, which is what one proposes to explain hereafter.

There is precious little use in preparing for ten years ahead and neglecting things which ought to happen ten weeks or less ahead, which is what we are doing now.

## The Proper Function of Croydon.

Considered purely as a kind of aeronautical Charing Cross the Croydon Aerodrome does not justify its existence. And it is not in the least likely to justify its existence so long as a foolishly conceived subsidy scheme limits its activities to administrating one British aeroplane per day to or from Paris and so long as its other work consists merely in housing a few French aeroplanes and British "joy-ride" machines.

The proper function of Croydon is to be the social and commercial centre of British Civil Aviation, much as Brooklands was in the very early days of flying and as Hendon was becoming under the genius of the ever-to-be-lamented Richard T. Gates, but very much more so.

Not only should the leading firms in the Aircraft Industry have their own sheds there, as they used to have at Brooklands and Hendon, but the Society of British Aircraft Constructors should have an office there, the Royal Aero Club should have a club-room there, and the Aerial League—if it still exists and intends to go on existing—should have a bureau of information and propaganda there.

Also every event of importance in connection with flying should be held at Croydon. The Royal Air Force Tournament should take place there. The Aerial Derby should start and finish there. Minor flying meetings should be organised there at frequent intervals—preferably on Sundays—by the Royal Aero Club, which is supposed to foster the Sport of Flying. Regular demonstrations of new and interesting Service aeroplanes should be given there by the military side of Air Ministry. And the Royal Aeronautical Society should hold meetings there in the Summer, at which the designers of machines and engines could explain their products on the spot to other designers and to people interested in aircraft construction.

Thus, without any appreciable increase of expense to anybody concerned, in fact probably with a very distinct saving by all concerned, we should acquire a great centre for what the French call "the vulgarisation of aeronautics." "Vulgarisation" is a better word than "propaganda" or "popularisation." It means creating a common interest for everybody in the particular thing to be vulgarised. Which is what British Aviation requires more than anything else at the moment.

## What the Great British Public Wants.

There are hundreds of thousands of people in this country who are keenly interested in flying and would willingly spend their week-ends at an aerodrome if they knew they could see some decent flying and some interesting machines when they reached the said aerodrome. There are thousands of visitors from all parts of the World who want to see flying and want to see modern aeroplanes but have nowhere to go to see such things.

People are constantly telephoning to this office asking where they can have a flight by paying for it or where they can go to see some flying. Only a few days ago the Overseas Club telephoned for information on this subject and said that visitors from Overseas Dominions were always asking them where flying could be seen and done. Even this enterprising organisation was ignorant of the fact that any visitor going to Croydon before midday can see the London-Paris machines of the various air lines starting, can lunch at the Trust House, can thereafter watch the arrival of the Paris-London machines, and can have a flight at a cost of a few shillings on one or other of the Surrey Flying Services' machines any day of the week.

So great is the existing interest in flying that a very little intelligent work in co-operation between the Department of Civil Aviation, the Aircraft Industry, the Royal Aero Club, and the Aerial League (if it still exists) would soon rouse general enthusiasm for aviation among residents and sojourners in London and so would spread interest and faith in aviation throughout the Empire.

## An Admirable Situation.

The London Terminal Aerodrome is admirably situated to be the Centre of Aviation of the British Empire. It may be a mile or two further from the centre of London than is Hendon, but it is much easier to reach by rail and tram. For those who live in the West and South-West of London it is a far more pleasant journey by car, and probably there are more car owners within a radius of eight miles of Croydon than there are within the same radius of Hendon. And there are four main roads from London to Croydon, ending in a vastly wide road on two sides of the aerodrome and a lane on the other, whereas at Hendon two very bad roads end in a narrow lane which invariably produces a hopeless jam of traffic on busy days.

Furthermore, Croydon is much more pleasantly situated than is Hendon, and when the prevailing southerly to westerly winds are blowing the air is very much better, for the country to the South and West is more open. Also the country round about is more picturesque for those who go a-flying for pleasure and it is better country in which to do a forced landing.

The aerodrome itself is a better aerodrome. The surface at Croydon is as good as care can make it, whereas the surface at Hendon has never been really good and owing to its not having been used as a regular aerodrome for the past couple of years it is now execrably bad.

Both aerodromes have the disadvantage that in getting off against the prevailing south-west wind a machine has to face the sheds, but, whereas at Hendon it goes out over masses of buildings and an electric tram-line, at Croydon it has another aerodrome and open country in front of it as soon as it has cleared the sheds, which is a very considerable advantage to pilots giving demonstrations of new types.

## An Excellent Staff.

Finally Croydon rejoices in a permanent staff of officials, all enthusiastic for the progress of aviation and under the control of an officer who is perhaps the most enthusiastic of them all. Nothing is too much trouble for the Staff at Croydon. They are always pleased to put themselves at the service of visitors, whether arriving by aeroplane, by car, or on foot, if the said visitors will express their needs. Seeing that Hendon has done so little in the past two years one can hardly expect as much there. And naturally the Staff at Croydon is constantly in practice in dealing with visitors.

On the whole, therefore, it is fairly evident that not only is Croydon the only London aerodrome actually in being, but it is on all counts the proper place to be developed into that great Centre of British Aviation which is so much needed at this particular period in the history of flying.

### A Few Necsssary Improvements.

Naturally one cannot expect the full-blown Centre of Aviation to come into being all at once. It must develop gradually. But what is wanted at the moment is some hustling of the development.

First of all those members of the Great British Public who have already discovered Croydon should have some sort of reasonable accommodation when they arrive there. The present cattle-pen which does duty as a public enclosure is hopelessly inadequate. For a year or so there has been talk of enlarging this enclosure, and it is true that steps are now being taken to extend it so that a full view of the aerodrome can be had. But this work of fencing new enclosures must be very much extended at once if it is to be of any use this year. The latest small extension would only hold a thousand people at most.

Moreover, not only is fencing needed. There should be some sort of paving as well, for on a wet day the present enclosure becomes a quagmire. It is perhaps too much to ask for a strip of tarmac. But a strip of decent macadam would cost very little, or it might be possible to provide rough planking on which spectators could stand close to the fence. Also there is need for shelters from rain. The heavy showers last Saturday showed how much some sort of shelter is wanted. And proper sanitary arrangements should be provided. Doubtless such things exist among the multitudinous buildings, but there is nothing to indicate where they may be found.

In addition to the free enclosure there might well be a special enclosure for which a small charge would be made at ordinary times. This enclosure should be located in the corner beyond the Custom House and might well include that part of the ground where the lighthouses and the searchlight stand. It should communicate with one or other of the buildings at that end of the ground, so that the people in that enclosure could find shelter from showers.

This paying enclosure should also include a space in which cars could be parked, so that visitors could sit in their own cars and watch the flying. Incidentally, there should be better accommodation for cars than there is. Obviously Colonel Basil Foster's garage can only house a few cars, and in the event of anything like a popular invasion of the aerodrome there is nowhere at present for visitors to leave their automobiles.

### Inquiries and Booking.

Another need of a minor but very important kind is for an Inquiry Office. Though the staff at Croydon is always willing to help visitors there is nothing to tell visitors where they can find a member of the staff to give them the information they want. The ordinary shy Englishman or woman does not like running round asking questions, even from the affable policemen who guard the Customs House so zealously.

The Inquiry Office should also be a Booking Office for passenger flights and the fact should be largely advertised thereon. Thus the annoyance of touting for passengers would be removed.

In connection with the Inquiry and Booking Office—which should be in or alongside the Free Enclosure—there should be an arrangement by which parties of visitors could be conducted round the sheds in which the aeroplanes live on the other side of Plough Lane. This might be a trifle troublesome, but it ought to be done in order to educate the public. One's personal experience is that friends whom one has brought down to Croydon have always been more interested in seeing the machines at close quarters than in merely watching the flying.

Of course when Croydon becomes a great Trade centre, the manufacturers will have their own people on the spot to show visitors their machines, and on days when there is a crowd present they will have their machines out in front of the enclosures to be viewed by all and sundry, as they used to do at Hendon and Brooklands. But for the time being it will be well for the staff of the aerodrome to arrange personally conducted tours of the sheds.

### The Aero Club's Great Opportunity.

The various points aforementioned concern the Department of Civil Aviation. Let us now turn to others whose duty and whose interest it is to develop the Centre of British Aviation.

The first great opportunity is undoubtedly in the hands of the Royal Aero Club, provided of course that the Club with its high-sounding list of Patrons and Stewards aspires to be the governing and promoting power of the Sport of Flying and not merely a cosy bar-parlour for golfists, automobile dealers and bridge-players.

Last year the Club acquired half a dozen aeroplanes which it proposes to hire to such of its members as still desire to fly. These machines are to be housed in future at Croydon and are expected to arrive there in a week or two. One suggests that as soon as possible after their arrival the Royal Aero Club should arrange a special R.Ae.C Sunday Afternoon to inaugurate the advent of club flying.

A few particularly good pilots should be invited to fly the single-seaters belonging to the Club and demonstrate what can be done with them. And a few safe and steady pilots should be asked to fly the two-seaters and to take up as passengers members of the Club and their friends, who would draw lots for free flights.

The Club could well afford to do this to start the ball rolling, and to induce members to meet at an aerodrome instead of across a table or at a bar. Also, as womenfolk are excluded from the Club premises (fortunately on occasion, one regrets to say), this meeting would offer an opportunity for a foregathering such as used to be provided by the annual Aero Club Banquet, which for some queer reason seems to have ceased to exist.

### Pleasant Sunday Afternoons.

If this inaugural meeting proved successful, as it undoubtedly would, then the Club—if its Committee had any energy left after such an effort—should arrange an R.Ae.C. Sunday Afternoon at Croydon say once a month. Thus members would have regular fixed dates for friendly meetings, and we might bring back again something of the old happy days of Brooklands when on Sundays one met all one's friends and discussed all the affairs of aviation.

It is certain that such meetings would be greatly appreciated, for on various occasions, such as the famous Air Conference show at Croydon last year and the Paris-London and back race and the Aeronautical Society's dinner, one met crowds of people whom one knew and all expressed the wish that similar gatherings of aviatic enthusiasts could be arranged more often. It is obviously the duty of the Committee of the Royal Aero Club—if it has any initiative and energy—to arrange dates for such gatherings.

They involve no cost. All that is necessary is to ask the Department of Civil Aviation to rope off an enclosure for members of the R.Ae.C. on the aerodrome and to lend one of the vacant buildings for a tea-room. Trust Houses Ltd. will provide the teas. So the Committee of the R.Ae.C. need not do any work in connection with these gatherings, and as the Committee has taken so little active part in aviation in the past the individual members of the Committee need not even be pressed to be present. The ordinary members will go fast enough if they have the chance.

### The Proper Place for the Aerial Derby.

It is only the first step which costs anything. In this case no money and very little trouble is involved. After that the next step is to remove the Aerial Derby from Hendon and to make Croydon the starting and finishing place. The Department of Civil Aviation will certainly make all the necessary arrangements concerned with handling the crowd, putting up fencing and so forth.

There might conceivably be a trifling difficulty about the legality of taking gate-money at an aerodrome which is the Nation's property. But if it is demonstrated to the Treasury that there is money to be made out of doing so it may be assumed that the Law officers of the Crown will soon find precedents and a way of legalising whatever arrangements may be necessary.

But, as such matters as these take some little time to settle and as the Aerial Derby is due a couple of months hence, it will be well to take steps immediately to have everything done decently and in order.

### Where the R.A.F. Tournament Should be Held.

Even more important than the Aerial Derby is the R.A.F. Tournament. This most certainly ought to be held at Croydon. Why officers of the R.A.F. should want to hold the Tournament at a privately owned aerodrome when there exists a much better and much more convenient aerodrome which is already the property of the Air Ministry is something of a mystery. Perhaps it is because those chiefly responsible for the Tournament have been to Hendon but have not hitherto honoured Croydon with their presence.

One recommends that these Great Great Ones fly over to Hendon and land there to inspect the aerodrome and that, if they survive the landing there and departure thence, they fly thereafter to Croydon. One does not doubt that the differences between the surfaces and the atmospheres (social and meteorological) of the two aerodromes will remove all need of further argument.

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# The Fairey Aviation Company,

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**CONTRACTORS to BRITISH ADMIRALTY, WAR OFFICE and AIR MINISTRY.**

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*Constructeurs, sur commande spéciale du Gouvernement Britannique, du plus grand bateau volante construit jusqu'à ce jour.*

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Diseñadores, á pedido especial del Gobierno Británico del barco aéreo mas grande que se ha construido para este gobierno.

Proveedores de todo lo necesario para servicios de transporte aéreo de pasajeros, correos y mercancías.

Diseñadores y constructores del tipo Fairey III. Serie de aparatos suminstrados en cantidad al Gobierno Británico, durante la guerra *y después de su terminación.* En esta serie de aparatos, el fúselage, el plano central y la unidad de la cola, son standard y fabricados para adaptarse á diferentes tipos de alas, chassis y motores de otros aparatos de series que sean adecuadas para ejecutar los fines particulares para los cuales se requiera el empleo del aparato. Todas las máquinas de este tipo, tienen alas plegadizas y eatán provistas del dispositivo patentado de combeo variable Fairey que da una alta performance y potencia de ascensión combinada con una velocidad baja de aterrisaje.

### For the Pillars of the Empire.

Another opportunity, this time for the Department of Civil Aviation, to help towards popularising the Centre of British Aviation, is provided by the visit to this country of an assortment of Premiers and other politicians (with perchance some statesmen) from the British Dominions Overseas. One would dignify them by calling them Colonials if one thought that they realised that a Colony is a "colonia" or "column" which supports the fabric of Empire.

One suggests that at as early a date as may be after the arrival of these estimable gentlemen the Department of Civil Aviation should arrange a big demonstration of aerial transport at Croydon for their edification and education. Given free petrol as on the occasion of the Air Conference every manufacturer who has a machine which will stagger into the air will send it to Croydon, if only to sit on the ground and be admired—as did some of those which arrived on that occasion.

The demonstration should be arranged for a Saturday or Sunday so as to give the Public a chance of participating and so as not to interfere with the purely political conferences which the Overseas visitors will have to attend. One feels sure that the numerous wives, sisters, cousins, and aunts who will accompany them and their suites would be delighted to spend a pleasant day at Croydon.

Here is a chance not merely of "enthusiasming" the Public but of spreading the Gospel of Aviation all over the Empire. Will the Department of Civil Aviation lose its opportunity?

### Progress Without Expense.

One has endeavoured to set forth hereinbefore something in the way of a constructive programme for the next two or three months which, if the Powers that Be act upon it promptly and energetically, is bound to have far-reaching effects on the future of British Civil Aviation. Practically no expense is involved. It merely means a concentration of effort in one spot, and enthusiastic co-operation between all who are concerned for the progress of flying.

It does not even mean extra hard work for anybody, for these gatherings at the Centre of British Aviation will be a welcome holiday for most of those present and ought to be a labour of love for those who have to do what little actual work has to be done. Whether such meetings take place and whether such a concentration of effort is made will prove in the course of the present Summer whether or not those on whom the future of British Aviation at present depends are worthy of their places in the scheme of things.—C. G. G.

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## AN AMBITIOUS UNDERTAKING.

The following appears in the latest list of new companies registered :—

NATIONAL AIR TRANSPORT CO., LTD.—Private company. Registered April 26th. Capital, £1,000 in £1 shares. To carry on (subject to license from H.M. Postmaster General, where necessary), the business of carriers by air, steamship, motor and rail, in and between the British Isles and elsewhere. The subscribers (each with one share) are :—H. S. Higginbottom, Gwastad Hall near Wrexham, colliery proprietor; A. Bryning, Albert House, Rock Ferry, Ches., director. The subscribers may appoint themselves to be directors. Qualification : £100. Remuneration : £100 each per annum (chairman £125). Solicitor : J. H. Baker, Lennox House, Norfolk Street, Strand, W.C.

A national company formed expressly subject to licence from the Postmaster-General suggests that there may be very much more in this registration than meets the eye.

## A SIGNIFICANT JOURNEY.

Mr. F. Handley Page is now on his way to the United States. It will be remembered that there is an American Handley Page Company financed by American capital. Therefore it may be assumed that Mr. Page's visit is concerned with the production of slot-winged Handley Page aeroplanes in the States. It will be interesting if machines of this type are taken up by American manufacturers before British aircraft makers see fit to progress in this direction.

American acuteness has adopted in the past improvements in cycles and motor cars which have been neglected in this country, and history has a persistent way of repeating itself.

## THE RIVER AIR PORTS.

As stated elsewhere in this paper, the Napier-engined Vickers "Viking III" left the Air Port of Westminster on Friday piloted by Messrs. Cockerell and Broome with Major-General Sir F. H. Sykes and Lieut.-Col. W. D. Beatty as passengers. The machine flew to Paris, where it alighted on the Seine in the heart of the city

The machine carried out various tests similar to those conducted at Westminster, and took as passengers various officials of the French Government Departments. These officials seem to have been favourably impressed with the possibility of the river air port proposition as a means of doing away with terminal motor car journeys from aerodrome to city.

It is hoped therefore that as soon as a commercial amphibian is produced, and the new "Viking IV" now under construction at Weybridge will probably prove to be suitable for commercial work, there will be a saving of at least one and a half hours on the London-Paris Air Route.

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# NAVAL AND MILITARY AERONAUTICS.

### Royal Air Force Cadetships.

FORTHCOMING ENTRANCE EXAMINATION.

The Air Ministry announces that an examination for entrance into the Royal Air Force Cadet College will be held on June 28th, 1921, and following days.

The number of cadetships open to competition at this examination will not be less than 25 inclusive of King's Cadets or Honorary King's Cadets, and will include the award of not less than one prize cadetship.

Candidates must have attained the age of 17½ and not have attained the age of 19 on July 1st, 1921, the only exception being in the case of a candidate who

(a) Was serving on Jan. 1st, 1920 (or who had served prior to that date), in the Royal Navy, Royal Marines, Regular Army, Royal Air Force, Special Reserve, Indian Army Reserve of Officers, Militia, Territorial Force, or in the Forces of the Overseas Dominions; or

(b) Was serving on March 1st, 1919 (or who had served prior to that date), in the Senior Division of the Officers' Training Corps;

and who, in addition to fulfilling the above conditions, is recommended by his Commanding Officer as suitable in all respects for appointment to a permanent commission in the Royal Air Force, in which case the upper limit of age will be 21.

Candidates must apply in writing to the Secretary, Civil Service Commissioners, Burlington Gardens, London, W.1, for forms of application, and the forms should be completed and returned not later than May 12th next. No application received later than May 26th will be accepted under any circumstances.

The competition will be conducted in accordance with the Provisional Regulations for the Royal Air Force (Cadet) College, (Air Publication 121), which may be obtained from His Majesty's Stationery Office, Imperial House, Kingsway, W.C.2 (price 6d.).

### The "Wakefield" Scholarships.

To assist in defraying the expenses of residence at the Royal Air Force (Cadet) College, in the case of cadets whose parents or guardians are in reduced circumstances, Sir Charles Wakefield has generously undertaken to provide funds for a period of three years for the annual award of two scholarships, each of the value of £75 per annum.

Preference will be given where reduced circumstances are due to the late war.

One scholarship will be offered for competition at the examination held in June and one at that held in November. Scholarships will be tenable for two years.

On each occasion the scholarship will be awarded to the candidate, accepted as eligible by the Air Council, who passes highest into the College.

The names of intending candidates should be forwarded to the Secretary (S.7), Air Ministry, Kingsway, London, W.C.2.

Applications should normally reach the Air Ministry not later than Jan. 15th and May 15th, in the case of the June and November examinations respectively. They will, however, be accepted provided they are received not later than May 1st and Oct. 1st respectively.

Each application should be accompanied by a full statement (which will be treated as strictly confidential) of the circumstances of the candidate's case. The Air Council will decide upon the eligibility or otherwise of the candidate.

### Senior Officers' Course at Chisledon.

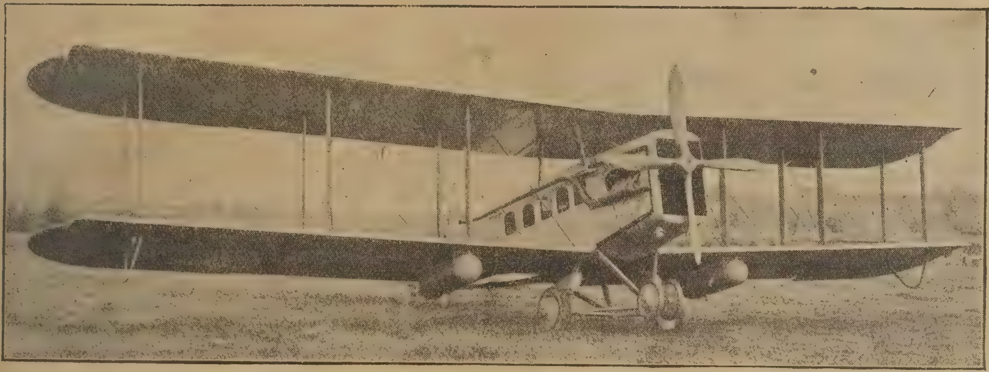
In a list of officers given in a recent Army Order who passed satisfactorily the Senior Officers' Course No. 1, at the School of Military Administration, Chisledon, from Jan. 14th to Feb. 25th, the following R.A.F. officers are shown :—Sqdn.-Ldr. E. H. Sparling, A.F.C., and Sqdn.-Ldr. B. H. de Roeper, A.F.C.

### Boy Mechanics for the R.A.F.

The Air Ministry has asked the London County Council to nominate suitable lads for service as boy mechanics in the Royal Air Force. The course of training extends over three years, during which time the mechanics will receive instruction in a skilled trade and their general education will be continued. The original attestation will be for twelve years (ten years regular and two years reserve service) counted from the date of entry.

# WESTLAND

(REGISTERED TRADE MARK)



WESTLAND NAPIER LIMOUSINE.

Petters Limited, winners of the first prize in the British Air Ministry Competition, 1920, now have at their Westland Aircraft Works, Yeovil, for delivery the following Aerial Fleet:—

1. **Westland Rolls-Royce Limousine** - Capacity: 3 passengers and light luggage.
2. **Westland Rolls-Royce Limousine** - Capacity: 3 passengers and light luggage.
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4. **Westland Hispano Limousine** - Capacity: 3 passengers and increased luggage accommodation.
5. Also, nearing completion, **an improved WESTLAND HISPANO LIMOUSINE** with seating capacity for four passengers and luggage.

With a view to encouraging the establishment of aerial communication between London and Paris or elsewhere, Petters Limited are prepared to dispose of the foregoing aeroplanes on favourable terms, and they invite immediate enquiries from prospective purchasers in order that full advantage may be taken of the forthcoming Spring and Summer Traffic.

Travellers by Air demand the **Best**, the most **Reliable** and the most **Comfortable** machines. **The Air Ministry Competition** ***has proved*** that **we** have them.

## WESTLAND AIRCRAFT WORKS

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*Telephone:*
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Is a fully licensed landing ground for all types of Aeroplanes and Amphibians.

## NO LANDING FEES ARE CHARGED.

Staff of highly skilled mechanics under fully qualified ground engineers always available.
Petrol and oil supplied. Overhauls, modifications and repairs promptly executed.
Minor repairs or adjustments carried out while you wait.
De Havilland machines are always ready for hire on hourly or mileage basis.

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*Extract from letter recently received:*—"We wish to express our great appreciation of the work lately done by your mechanics on our machine. The job was executed in a particularly thorough and careful way and gave every satisfaction."

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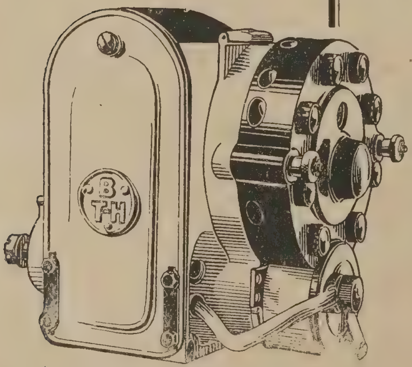

B.T.H —the Quality Magneto.

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—the quality magnetos all-British in design and construction—have an enviable reputation for reliability.

The faith of air pilots in the efficiency and reliability of B.T.H. Magnetos is fully justified by their performance in service.

B.T.H. Magnetos were fitted to the first British airship to cross the Atlantic, to the Aerial Derby winners at Hendon, 1919 and 1920, to the first aeroplane making a non-stop flight from London to Madrid, etc., etc.

In addition, B.T.H. Magnetos were fitted to five out of the eight prize winners in the Air Ministry 1920 Aeroplane Trials at Martlesham Heath.

**The British Thomson-Houston Company, Limited,**
**Lower Ford Street :: :: :: Coventry.**

# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

Certain pronouncements of the "Scientific Correspondent" of the *Times* as to the Progress of Science in Aeronautical research are dealt with in the article below. This article gives an example of the danger which results from the general public ignorance of science. Doubtless to the average reader the statements of the *Times'* correspondent will be accepted as an accurate exposition of the present condition of aircraft research.

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A note as to the activities of the Van Berkel's Patent Company, of Rotterdam, gives some interesting information as to the progress of German metallurgists in improving the anti-corrosive qualities of duralumin.

The results of certain tests on the resistance of struts, made at the Göttingen aerodynamic laboratory, are given in this issue. These are of great interest, as they show that the effect of surface roughness may be very great at speeds corresponding to those of actual flight, and that the resistance of some bodies may depart very widely from the usually accepted "square law."

The results are not necessarily of very great practical importance, as these effects apparently occur only with bodies of very low resistance, and such bodies can only form a small part of the total resistance of a practical aeroplane, and the departure of this small proportion from the square law will not cause the whole resistance to depart appreciably from that law.

## SCIENCE AND NONSENSE.

One expects little either of sense or of science from the ordinary news-sheet. The *Times* in some respects is not yet an ordinary news-sheet. It has of late years contracted many of the vices of its more plebeian rivals, but one has usually been justified in expecting that special articles, purporting to be written by specialist correspondents, should deal at least rationally with their subject. There is of course the medical correspondent, with the invariable advice that on the appearance of any unpleasant symptoms one should at once retire to bed and send for one's doctor, but as evidence of a tendency towards professional solidarity even this may have its value.

The articles which from time to time appear under the heading "The Progress of Science," written by the *Times* "Scientific Correspondent," have usually been interesting and intelligently written, if a little loose in argument, but that which appeared on April 26th, dealing with "Aircraft Research" is unworthy of a Sunday picture paper.

### Emerging from a "Welter."

The writer begins by stating that two types of aircraft only, the rigid airship and the biplane have emerged from "a welter of designs" and justified their existence by their performances. He then suggests that owing to the danger of breakdown in the air "the readiest path of progress will be in the direction of improving existing models."

Assuming that the author is not of those who, before the war, regarding a Bleriot type XI, inquired whether it were a Bristol or a biplane, this can only be taken to mean that the author believes that there is some subtle danger in the transition from biplane to mono- or multiplane structures.

In the days before the war, when the R.F.C. banned monoplanes, such an attitude was excusable. Little was known as to the loads which were imposed on aircraft, particularly in manœuvring, and, by a pure fluke, it did happen that the average biplane of those days could not be unwittingly overloaded to the same extent, and at the same time was probably better fortified against manœuvring loads than was the average monoplane. In the light of present-day knowledge one need have no more anxiety as to the safety either of mono- or multiplanes than one has as to the biplane—provided that a competent designer is responsible for their aerodynamic and structural features.

At the present moment the monoplane is becoming increasingly prominent, and it seems not impossible that within a few years it will again be the most common type of aircraft. If the revival of the monoplane prove to be but temporary, its eventual failure will be due not to any intrinsic lack of safety on the part of the type, but solely to the fact that it proves a less economical structure than the biplane or multiplane.

Thereafter the writer states that "aircraft require a framework which must be light, rigid, and durable. At present the most suitable material is an alloy of aluminium. . . ." It is but charitable to suppose that the author meant to refer to airships alone, but his statement as published cannot be substantiated in regard to aeroplanes.

### The Truth About Aluminium Alloys.

Certain German aircraft, notably the Junkers monoplanes, have been constructed entirely of the material mentioned. Very great credit is due to Professor Junkers and other German designers for the ingenuity displayed in these machines and for the results obtained with them. The machines so built have certain undoubted advantages, due to the material, as compared with machines built of wood.

But such experience as is yet available by no means suffices to prove that the countervailing disadvantages of this material are of less account than the advantages, or that an aluminium alloy is superior to steel.

As a matter of fact in the most recent all-metal aeroplanes built by the Zeppelin Company—whose experience of aluminium alloys is unrivalled—steel is used for all the more heavily stressed members, aluminium being confined to the less heavily loaded portions of the structure.

Further in the same paragraph he states: "Increase in size, giving a greater margin of power and of lift, will allow for the use of the most resistant metals or alloys even if these be heavier."

### More Confusion.

This again is true if airships alone are considered, but with increase in the size of aeroplanes, the margin of power and of lift tends to decrease. It is, however, true that the larger the aeroplane, the easier it will be to use high tensile steel as a structural member. This is because the thickness of section of the steel will increase with the size of the aeroplane. With very thin sections, secondary stresses of a local nature lead to breakdown before the full resistance of a beam is exerted against the primary or main stresses, and the resistance to these local failures is practically a function of the thickness of the section, and not of the ultimate strength of the steel. That is, for spars of the size needed for the ordinary single-engined machine of to-day, 50-ton steel is as good as 100-ton steel—if of the same thickness they will fail under the same load owing to these secondary stresses. If the thickness of the section is sufficiently increased these secondary stresses become of less importance, and it becomes possible to make use of the qualities of the higher grade steel.

### A Poetic Effusion.

Referring specifically to the aeroplane, it is said that: "Once up in the air, its ideal, so to speak, is to resemble a winged bullet, a projectile with only sufficient wing or fin to steady it, and with a speed that will drive it through any storm. But when it has to alight or to leave the ground its ideal is the large-winged slowly hovering bird. Until these contradictory needs have been reconciled an average has to be struck between them, the size of aerodromes has to be large, and safe ascents and descents require a strong head-wind."

Had the article been written by the *Times'* Spring Poet one would scarcely have cavilled at these remarks. But one who claims to discuss the aeroplane from a scientific standpoint might be expected to have discovered that the function of a wing is the supporting of the aeroplane, and that for any given speed of flight, and any given total weight, there is a definite size of wing which will require the minimum expenditure of power, and that the smaller this wing, the higher the most efficient speed, but also the greater the power necessary. His ideal in the air therefore involves an infinite expenditure of power.

### Great Expectations.

The writer thereafter mentions the helicopter as a possible solution of this quandary, but considers the hope of attaining the expanding wing and the variable pitch airscrew as still more attractive. In fact both the expanding wing and the variable pitch airscrew exist and have been used in the air. The first may, the second undoubtedly will, aid in the advance of aeronautics, but neither has any prospect of revolutionising flying.

The concluding paragraph of the article deals with the airship, and refers specially to the development of the mooring mast. A reference in somewhat an optimistic vein is also made to the supposed possibility of using helium. It is perfectly true that research in America has resulted in a great cheapening and a large increase in the supply of this gas, but its present price—said to be 7d. per cubic foot—is still prohibitive, and there is very grave doubt whether the American supply will ever suffice for the airship needs of the American Air Services alone. For commercial purposes the loss of lift—roughly equal to 15 per cent. of the disposable lift of a 2,000,000 cubic ft. rigid, will always be a serious handicap to the use of this gas.

Altogether the article is most regrettably misleading, and of a type likely to do much harm.—W. H. S.

## VAN BERKEL'S ACTIVITIES.

The Maatchappij Van Berkel's Patent, the constructors of the very interesting seaplane which was illustrated in this journal recently, state that they have taken a licence for the manufacture in Holland of the Dornier tractor flying-boat, type Do Cs.11, which was illustrated in the same issue as was the Van Berkel's machine.

They state that this machine has excellent features, that owing to the narrow engine, the forward view of the pilot is at least as good as in the normal type of tractor machine, and that the lateral stability and the manœuvrability of the machine on the water is all that could be desired.

The passenger cabin gives ample room for five passengers (the German accounts give six as the capacity) and with this load, pilot and fuel for 3½ hours at full speed or five hours at cruising speed can be carried. The machine takes off quite happily in a reasonable following wind, or in a quite healthy side wind.

The machine is said to be a great improvement in the matter of water stability over the earlier two-engine Dornier passenger boat.

With regard to the sea monoplane of their own design, Van Berkel's Patent point out that an impression has arisen that this machine is a copy of a Brandenburg seaplane. It is to be pointed out that the Brandenburgs actually built in Holland were all biplanes, and that the Van Berkel's monoplane is a considerably larger and more powerful machine than any Brandenburg sea monoplane. It is in fact an entirely new design—carried out from the beginning by Van Berkel's Patent.

In the matter of the use of duralumin as a float material, it is stated that the duralumin used is a material which has been subjected to a special heat treatment. The process was developed in 1915 by the Düren Works in Germany, and this special duralumin has been found to be extremely satisfactory for sea work. So far as can be discovered no other firm has succeeded in producing an equally satisfactory material, and it is said that British tests of duralumin in salt water prove that the British alloy is entirely different in its qualities in resisting corrosion.

The following is a literal translation of a report from the Dutch Naval Air Service on this alloy :—

Marine Luchtvaart Dienst.
(Naval Air Service).

De Kooy Air Station,
Den Helder 14/12/20.

In reply to your letter of Dec. 6th, as to duralumin floats, I have the honour to forward the enclosed report of the test of a sample of duralumin made in the East Indies.

"A piece of clean duralumin sheet was attached at Tandjong Priok, Batavia, to a float in such a way that about half of it was immersed in sea water. In this position it remained for one month. At the end of this time it was found, on inspection, that even at the point where water and air met, the material showed no visible effect of the sea water."

"The result of the test was therefore favourable In Holland duralumin floats are in use with success.

"(Sgd.) Commander M.L.D. D. Vreede."

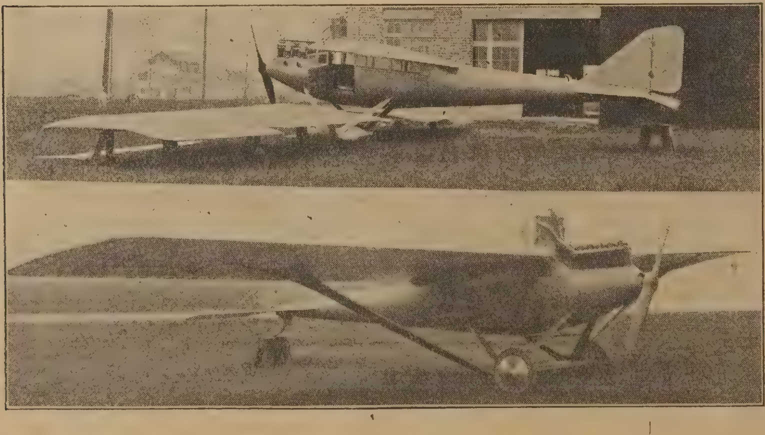
## A LARGE ITALIAN FLYING BOAT.

According to *La Propaganda Sportiva e Turistica,* of Turin, La Compagnia Bastianelli of Rome have built a large flying boat known as the P.R.B. (Pegna, Rossi, Bastianelli). The machine is an equal winged biplane, with three rows of interplane struts on each side, fitted with two wing nacelles each containing two engines, driving tandem airscrews.

The hull, of a maximum beam of 3.2 metres, is Vee bottomed and fitted with one step and apparently contains a roomy passenger cabin. The tail is a biplane, carried on a central fin, and fitted with one wide interplane strut on each side. Rudders, elevators, and ailerons are all balanced. The particulars available are as given in the specification below :—

Specification of the P.R.B. Flying-boat.

| | | | |
|---|---|---|---|
| Length over all | 16.5 m. | Seating and controls | 100 kg. |
| Span | 30.0 m. | Tanks, pump, and piping | 200 kg. |
| Height over all | 6.5 m. | Engines, airscrews and radiators | 1,450 kg. |
| Total area | 206 m. | Sundries | 50 kg. |
| Engines | 4 Isotta-Fraschini V6 | Total weight empty | 4,000 kg. |
| H.P. | 277 at 1,300 r.p.m. | Disposable load | 3,300 kd. |
| Weights :— | | Loading | 25.7 kg. per sq. m. |
| Wing cellule | 1,000 kg. | Cruising speed | 160 km.p.h. |
| Hull | 1,000 kg. | Fuel capacity cruising | —10 hr. |
| Wing floats | 100 kg. | Climb | 4,000 metres 30 m. 35 sec. |
| Tail | 100 kg. | | |



**AN AMERICAN PASSENGER CARRIER.** — The accompanying photographs give a good idea of the Jacuzzi six-passenger monoplane which was described in this paper for March 9th. Jacuzzi Bros. Inc. of Berkley, California, the makers of this machine, is a concern mainly composed of six brothers Jacuzzi of Italian parentage. Mr. R. Jacuzzi is the president of the firm and designer of the machine.

One machine of this type is being tested in the service of the American Post Office, and is being used over San Francisco to Reno route of the Air Mail Service, a route which calls for the crossing of the Sierra Nevada at a point 8,000 ft. high.

*The Test of Quality*

**"SHELL" is the only motor spirit**

supplied to dealers in bulk for re-sale through kerbside plants under the following conditions:

*That "Shell" will be stored and retailed separately, not mixed with motor spirit of any other brand or grade.*

These conditions are made in the interests of the motoring public equally with our own. We know that in "Shell" we possess infinitely the best motor spirit procurable, and we cannot risk its use for raising the quality of inferior brands or grades of petrol.

**Shell-Mex** Ltd.

KINGSWAY, LONDON, W.C.2.

## SOME EXTRAORDINARY RESISTANCE TESTS.

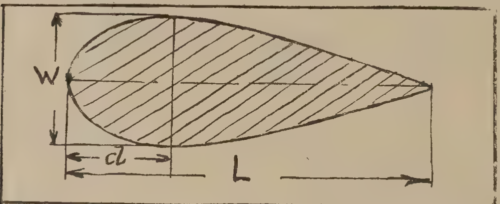
Technical Note No. 33 of the American Advisory Committee for Aeronautics consists of a translation of a report by Dr. C. Wieselberger, of the Göttingen Aerodynamic Laboratory, on "The Effect of the Nature of Surfaces on Resistance."

The origin of this report was a series of tests made at Göttingen during the war, at the request of the D.F.W. company of Leipzic, of certain aeroplane struts. The results were so striking that a further series of tests were carried out later.

The struts tested were of large size, such as would be used on giant aircraft, and they were all of 2.5-metre length—a length 0.27 metres greater than the diameter of the air stream in which they were tested. This fact may to some extent influence the deductions to be drawn from the results of the tests, but it scarcely affects the remarkable results obtained on one and the same strut when tested under different conditions. The actual section dimensions of all the struts tested are given in a figure attached.

All the struts were covered with linen fabric and given one coat of varnish, and the resulting surface was slightly rough.

Measurements of resistance were made on each strut at air speeds ranging from about 10 metres to about 45 metres per second. In accordance with the results of many other experiments it was found that the resistance coefficient of these struts diminished as the speed was increased from the 10-metre value, but in the case of every strut except No. 4 this drop ceased and the resistance co-efficient again increased with further rise in the wind speed.



| Strut No | L | W | a | $\frac{W}{L}$ | $\frac{a}{L}$ | $\frac{a}{W}$ |
|---|---|---|---|---|---|---|
| | | m/m | | | | |
| 1 | 150 | 54 | 43 | 0·36 | 0·29 | 0·80 |
| 2 | 216 | 75 | 60 | 0·35 | 0·28 | 0·80 |
| 3 | 247 | 85 | 69 | 0·345 | 0·28 | 0·81 |
| 4 | 272 | 94 | 77 | 0·35 | 0·28 | 0·82 |
| 5 | 364 | 138 | 103 | 0·37 | 0·28 | 0·77 |
| 6 | 454 | 154 | 129 | 0·33 | 0·28 | 0·84 |
| 7 | 400 | 177 | 114 | 0·44 | 0·28 | 0·64 |

In the case of struts Nos. 1, 2, and 5, this increase in resistance coefficient is not very great, in No. 4 it is negligible, but in the case of Nos. 3, 5, 6, and 7 it is very marked indeed. In the case of No. 3 the resistance coefficient (Cw) rises from a minimum of 7.4 at 20 metres per sec. to 14.7 at 49.9 metres per sec., and appears to be still rising rapidly. In No. 7, the minimum value of Cw is 9.00 at 14.9 metres per sec, and 23 at 49.6 metres per sec. This means for these two struts a total resistance more nearly proportional to the cube than to the square of the speed, within that speed range.

The air speed range is approximately 35 to 110 m.p.h., and the struts are full size, so that this phenomenon is within the range of actual flying conditions.

The same struts were thereafter rubbed down with sandpaper to produce a smooth surface and retested over the same range of speeds.

The values of resistance and of resistance coefficients at the lower speeds were very little changed, but the rise of the resistance coefficient at high speeds disappeared—except in the case of strut No. 7, where a slight rise occurs. The minimum value of Cw in this case was 7.00 at 35 metres, and the value at 45.3 metres had risen to 7.66. The figure at 35 metres however does not lie fairly on the curve of resistance, and is possibly incorrect, the true minimum being probably 7.19 at 25 metres.

Thus the same struts when smoothed follow much more closely the usually accepted square law above a certain critical speed.

The tests therefore indicate that, contrary to certain conclusions of the N.P.L., roughness of surfaces of the order met with in practice may have a very important effect on the resistance of aeroplane components.

There are other curious facts disclosed by these tests, though they may be related to the fact that the struts projected beyond the air stream in which they are tested. The figures given for the proportion of these struts show that, except Nos. 6 and 7, all the sections are closely of the same form. The usual assumption as to the conditions of similarity would lead one to expect that with struts 1 to 5 at least, at the same value for the product of wind speed and width of strut, the value of the resistance coefficients of the different struts would be fairly closely the same

This is not the case, either for the rough struts or for the smooth ones. The differences in the case of rough struts may of course be simply due to differing degrees of roughness, an explanation which almost certainly accounts for the absence of any great difference between struts 1, 2 and 4 in the two states. The differences in Cw at corresponding speeds for struts 1 to 5, after being smoothed, are, however, worthy of note. The first column in the table (Vw) gives the product of air speed in metres per sec. and width of strut in millimetres.

| Vw. | Cw. | | | | |
|---|---|---|---|---|---|
| | No. 1 | No. 2 | No. 3 | No. 4 | No. 5 |
| 2,000 | 8.06 | 6.7 | 5.5 | 6.8 | 7.35 |
| 4,000 | — | — | 4.4 | 6.0 | 6.45 |
| 6,000 | — | — | — | — | 6.3 |

The values of resistance coefficient concerned are very small—that is the struts are of very good shape—and therefore one would expect their resistances to be very sensitive to slight changes in proportions. But differences in the resistance coefficient of over 50 per cent. between sections so nearly similar, tested at speeds apparently fulfilling the conditions of similarity, are not by any means to be expected. Unless it can be shown that these differences are due to lack of similarity as regard the conditions at the boundary of the air stream the results would seem to show that it is not safe to deduce from wind tunnel tests the resistance of any body other than that actually tested, however closely similar it may be in form and proportions.

## EXAMINATIONS FOR GROUND ENGINEERS.

Candidates desirous of becoming certified ground engineers (aircraft or engines) under section 4 of the Air Navigation Directions, 1919, may, until further notice, be examined at the Air Ministry (Alexandra House), Kingsway, London, W.C.2, on alternate Wednesdays from May 4, 1921, and monthly at Birmingham, Leeds, or Bristol, as required. Candidates can secure application forms from the Secretary (C.A.L.), Air Ministry, W.C.2, and should submit their completed forms, accompanied by a fee of 5s., at least seven days before the date on which the examination is desired, stating at which place they wish to be examined

## THE MANUFACTURERS AIRCRAFT ASSOCIATION INC., OF AMERICA.

It is announced that the firm of G. Elias and Bro., Inc., of Buffalo, New York, has now joined the Manufacturers' Aircraft Association. This is the twenty-first company to join the Association. Of this number sixteen are still active.

The house of G. Elias and Bro. was established as a partnership in 1881 and continued so until 1914, when the business was incorporated with a capital of 500,000 dols. and a surplus of 20,000 dols. In 1919 they established an aircraft department, and after two years of preliminary work, began the actual manufacture of aeroplanes on contracts awarded them by the Army and Navy on their own designs.

In the first Army Competition for designs, held on May 24th, 1920, they were awarded one of two prizes of 3000.00 dols. for the best designed training plane. On the second Army Competition for designs of seven different types they were awarded a prize of 4500.00 dols. for one of their designs.

In the Navy Competitions, in which some 45 designs were submitted, on Feb. 15th, 1921, theirs was one of five designs accepted for final examination.

They are now building land and sea planes for the Navy and training machines for the Army Their plant at Buffalo occupies twenty acres, on which the factory buildings contain about 300,000 sq. ft. of floor space.

The officers of the company are as follows :—A. J. Elias, president; A. A. Nessler, vice-president; J. A. Kreuser, treasurer; L. J. Koch, secretary; Max Stupar, supt. of construction; D. Earl Dunlap, designing engineer; Alexander Klemin, consulting engineer.

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# AIRCRAFT for EVERY PURPOSE

40 Aeroplanes a week was the average output of Boulton & Paul, Ltd., during the War. In all we supplied: 2,530 Aeroplanes, 70 large flying Boat Hulls, 7,835 Propellers and innumerable small parts for the Allies.

Since the cessation of these War orders our Aeronautical Research Department has concentrated particularly on the development of the All-Steel Aeroplane as well as Aeronautical Experiments generally.

We are thus equipped to meet all demands for the design and construction of Aircraft for every purpose.

## PARTICULARS OF THE P.9 AEROPLANE.

The P.9. illustrated below is a moderate powered general utility Biplane. It is easy to handle, has a large speed range, and may be used as a two-seater, or, with slight adjustments, as a cargo-carrier. The initial cost is low and the cost of running for a machine of this type and performance is reduced to a minimum. Owing to its small size, handling on the ground is easy. Dual controls are fitted, and comfort of pilot and passenger specially considered. The following is a brief specification of the P.9:

Engine—90 h.p. R.A.F. la type, Aircooled.

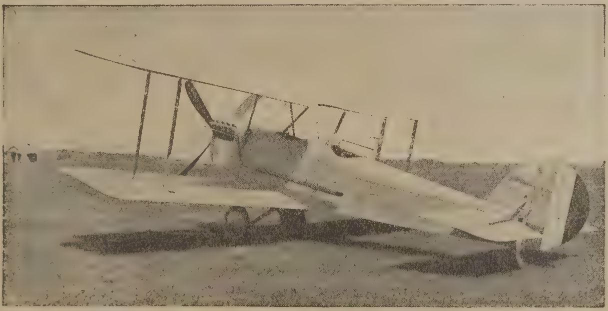
Performance—Speed: Fully loaded, 100 m.p.h. at 1,000 ft. Climb: Fully loaded, 10 minutes to 5,000 ft.

Weight—Machine empty, 1,244 lbs.; Useful load (crew, fuel, baggage), 526 lbs.; Total weight fully loaded, 1,770 lbs.; Load per sq. ft., 6.3 lbs.; Weight per b.h.p., 17.7 lbs.

Fuel—Tank capacity with full engine revs. at ground level, 3 hours. Tank capacity, 24 gallons.

Principal dimensions — Span, 27 ft. 6 ins.; Length, 25 ft.; Height, 10 ft.; Gap, 5 ft. 6 ins.; Chord, 5 ft. 6 ins.

WRITE FOR FULLEST PARTICULARS. ALL ENQUIRIES WILL RECEIVE DETAILED ATTENTION.



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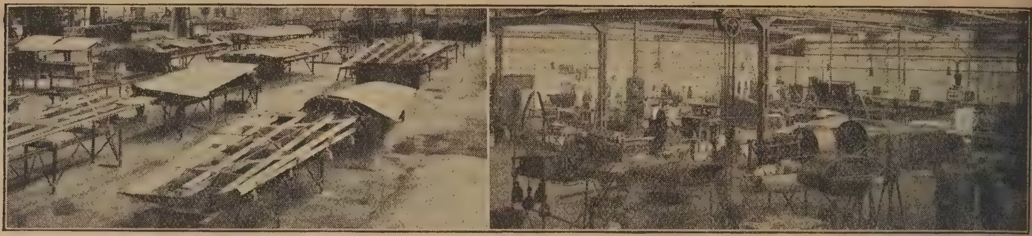


**Two views of the Junkers Works at Dessau, taken during war-time. On the left may be seen the wooden templates used for setting up the all metal wings. On the right, erection of the well-known monoplanes is in progress.**

## H.R.H. THE PRINCE OF WALES AT THE ROSS SMITH LECTURE.

H.R.H. the Prince of Wales attended by Captain the Hon. Piers Legh was present at Sir Ross Smith's lecture on the England-Australia Flight at the Philharmonic Hall on April 26th. His Royal Highness spent the interval talking to Sir Ross Smith and his brother, and expressed the opinion that the lecture should be visited by all school children.

## A DANISH AERO ENGINE.

According to a report from Copenhagen the Danish Royal Dockyard has for some time been experimenting with the production of aero-engines, and has now arrived at a type with which it professes itself satisfied.

This engine is of the six-cylinder, vertical, water-cooled type, giving 175 h.p. at 1,400 r.p.m., and weighs approximately 600 lb. Successful 50-hour endurance tests have been passed.—S. P.

## COMFORTING!

From an American eulogy of the aircraft parachute :—

"For an amateur the taking off will undoubtedly be unpleasant, but it is as desirable as dropping from the deck of a sinking ship into ice-cold water in the dead of night."

This American enthusiasm for novel experiences is always so refreshing.

## A CANARD D'AVRIL?

From an American journal for the propagation of aeronautical enthusiasm :—

"Mr and Mrs. Leslie C. Brand, of Glendale, California, celebrated April 1st in rather a unique fashion. They issued invitations to local aeronautic enthusiasts requesting their presence at an aeroplane luncheon to be held at their private club house, and attendance was requested by aeroplane only."

Unfortunately the journal in question does not explain the joke, for, contrary to reasonable expectations, quite a number of people did actually arrive by aeroplane. Perhaps after all the joke was on Mr. and Mrs. L. C. Brand.

## TRADE NOTES.

### Insurance for Air Force Personnel.

Officers and other members of the Royal Air Force who have considered the question of effecting an insurance on their lives will have discovered that the ordinary life insurance policies do not cover the risk of death by flying accident, nor do any of the usual accident insurance policies, and that the ordinary insurance companies demand enormous additions to the premiums to cover flying as well as the usual risks.

Therefore the policy which has been evolved by MacLaren, Pearson and Co. for the Union Insurance Society of Canton to cover flying accident risks in the case of members of the Royal Air Force is of interest and importance.

The policy covers flying accidents occurring in any part of the world, including night flying, stunting, or experimental flying, but excludes accidents flying on active service or in connection with war, civil commotions or the like abnormal conditions. It is limited to accidents occurring to machines the property of the Royal Air Force, and in the charge of a duly qualified R.A.F. pilot. In the case of officers learning to fly, who pay an additional premium, the condition as to a qualified pilot is withdrawn. A rebate is allowed upon the annual premium on renewal if there has been no claim during the previous year, at the rate of 5 per cent. for the first year, and increasing by 5 per cent. for each successive year up to the fifth. Thus at the fifth renewal, subject to the insuree having made no claim, the premium is reduced by 25 per cent. The rate for qualified pilots, observers, engineers and wireless operators (acting in their respective capacities) is £5 per annum per £100 insured. For cadets and other officers under instruction the rate is £7 10s. per £100 per annum. If desired ordinary personal accident risks can be covered by an additional premium of 15s. per £100 per annum.

The benefits secured per £100 insured for various degrees of damage are :—

Death, permanent total disablement, or loss of two limbs, or both eyes, or one limb and one eye, £100.

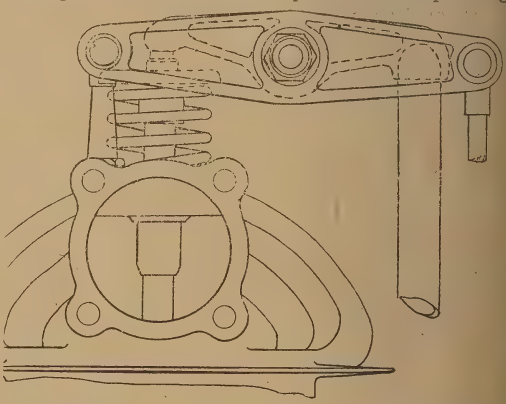
Loss of one limb or one eye, £50.

Those who are interested should apply to MacLaren, Pearson and Co., 48, Suffolk House, Laurence Pountney Hill, E.C.4, for full particulars and for a proposal form.

### A Device to Maintain a Constant Tappet Clearance.

In engines having overhead valves operated by push-rods the tappet clearances may increase when the engine is hot to an undesirable extent, owing to an expansion of the cylinder greater than that of the tappet rods. The Morgan valve-gear was originally designed to avoid this trouble on large gas engines, where it is customary to adjust the tappets after warming up.

The device offers a ready remedy for a similar trouble which is met with on large air-cooled engines, particularly those with aluminium cylinders. As will be seen from the drawing the usual valve rocker is pivoted to a compensating lever, which is itself pivoted at its one end to a lug on the cylinder head, and at its other end is linked to the crankcase or bed-plate. A study of the mechanism will make it clear that the movement of the cylinder head relative to the crank-chamber—due to expansion—is used to operate the compensating lever, which in turn carries the valve rocker, and so controls its position as to maintain constant tappet clearance.



This gear has been in use for over two years on a 300-h.p. National Gas Engine, during which time the tappets have not once been adjusted. The device is due to Mr. Raymond Morgan, of 1, Crown Office Row, Temple, London, E.C.4.

### The Napier Limousine.

One day recently one had the pleasure of a run in the 40-50 h.p. Napier limousine with Mr. H. T. Vane, managing-director of D. Napier and Son Ltd.

Personally one hates cars on the whole and has never been able to extract any pleasure out of riding in or driving them, merely regarding them as a useful substitute for aircraft until such a time as these can land anywhere.

But the 40-50-h.p. Napier is different. Of course Mr. Vane is a past-master in the art of driving, and the way the car accelerates is a joy for all time. The road from London to Croydon Aerodrome was appalling, and one has recollections now of pot holes encountered on a motor-bike on this route, but in the magnificent Napier one never even noticed these.

It seems that Napiers now stand as high in car-making as they do in the manufacture of aero-engines.—C. D.

The Armstrong Siddeley 150 h.p. Radial Engine.

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Engines

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Latest Models:
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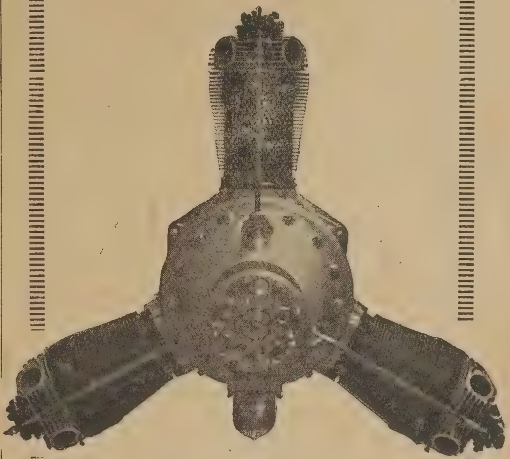
The 100 H.P.
"Bristol"
LUCIFER
Aero Engine



This engine combines simplicity of design, ease of assembly, reliability and long life with the numerous advantages incidental to an air-cooled engine.

It may be relied upon to run for long periods without overhauling or dismantling, while its general all-round performance and reliability compare favourably with the modern motor-car engine. For use in training, sporting and small commercial aircraft it is the ideal power unit.

*For further particulars write to—*

**The BRISTOL AEROPLANE CO., Ltd.**
FILTON—BRISTOL.
*Telegrams—Aviation, Bristol* *Telephone—39 6 Bristol*

## GOODS BY AIR.

### The Consignors' Point of View.

For some time past it has been the habit of that very interesting French journal *L'Air* to demand, by way of an interview, the opinions of various prominent persons on subjects of aeronautical interest. The results of these interviews are published under the heading "Nos Enquêtes."

The latest set of these inquiries have been addressed to traders who are alleged to have made use of aerial transportation in the course of their business. The inquiry was carried out by M. Henri Bergeron, and the results are worthy of reproduction. A translation of M. Bergeron's account is therefore appended :—

"The inquiry has been laborious and painful, for there are not only intelligent people in France, there are also . . . . others."

AT WORTH'S (LADIES' TAILOR).

"It had been affirmed to me that the costumier Worth often used the aerial services to deliver his creations to smart foreigners (feminine).

"I have been to see him. It was M. Rouff who received me —or rather showed me the door.

" 'Transport by aeroplane? Doesn't interest me, it never works; there is always a fog, or a breakdown. I use it the least often possible. I have other fish to fry than to worry with such affairs. Good-day.'

"Hum—that's a good start."

"But an old journalist is not to be troubled by so little. I left M. Rouff to his preoccupations—the inflation of the price of his works, the exploitation of needlework, and turned to one of his neighbours—Charvet—a shirt maker of not less grandeur.

AT CHARVETS.

"A little young man—of the 1925 class—greeted me with broad smiles, scenting doubtless 'big business.'

"No less smiling, I, in my turn, asked to be put into communication with some competent person, giving at the same time the reasons for my visit. The little man assumed a disdainful pout, and a person—a vague, an inglorious counter-jumper growled from behind his counter :—

" 'That it was inutile to insist.'

AT POIRET'S (COSTUMIER).

"A vast, vast house, preceded by an archway followed by a courtyard. On the left a statue of a faun, grimacing frightfully, regards from its pedestal those who pass.

"I perceived M. Poiret in his office as soon as I entered. For I must tell you that M. Poiret's office is of glass and one may see all that happens within, equally he may see all that passes without. M. Poiret received me, made me take a seat, listened to me, and understood me! Ha! at last I find an artist. This is what he told me :—

" 'I am greatly interested in aerial transport, and I use it the most possible. For one reason it moves rapidly. Moreover, I believe that it marks a desirable initiative and that one ought to help it.

" 'I have certainly had some delays during the winter—in bad weather—but it works very well. Anyhow, one must be indulgent. Improved as the aeroplanes have been, they are, nevertheless, at their beginnings as a method of practical transport. Also, as I love those people who keep ahead of the crowd, and the things of the day after to-morrow, I have made up my mind to use aerial transport every time that the opportunity offers, and thus to collaborate with the work of those who toil to bring aviation into the realm of practical utility. One must be of one's century, adapt oneself to its progress, help those who have courage.'

"And saying this Paul Poiret fixed his eyes on me, big eyes, eyes like great windows opening upon an unusually acute brain—a brain in the habit of taking long views and of thinking wisely.

AT JENNY'S.

"The Maison Jenny is among the concerns which make the most use of the air services. I was able to meet their manager.

" 'We are extremely pleased with transport by air. It runs wonderfully, very regularly. But what runs less smoothly, what imposes a very considerable handicap upon this new mode of transport, is the Customs arrangement.

" 'The aeroplanes transport the parcels which we confide to them with extreme rapidity, but the Customs authorities take two or three days to go through all the formalities of de-customisation.

" 'This leads to serious consequences. It often happens that an American customer, passing through Paris, comes to order a costume, saying: "I leave to-morrow for London, where I stay for a couple of days, forthwith embarking for America. If you can deliver the dress before that date I will take it. Send it to me by air, cash on delivery." We make the costume in a couple of days, and on the third despatch it by air. The aeroplane delivers it regularly on English territory, early in the afternoon of the day of despatch. Everything therefore should be well. But there is the Customs House, with its whims and its forms to be filled, and it has happened that a parcel sent by us has remained there for two and often three days.

" 'Result, our customer has left, and the goods remain on our hands, together with the costs of transport.'

"Does not the expense of air transport frighten you?"

" 'By no means. Any way, it is generally paid by the customer, and the firm would never let such an expense interfere with the urgent need for prompt delivery.'

" In fact you are satisfied?"

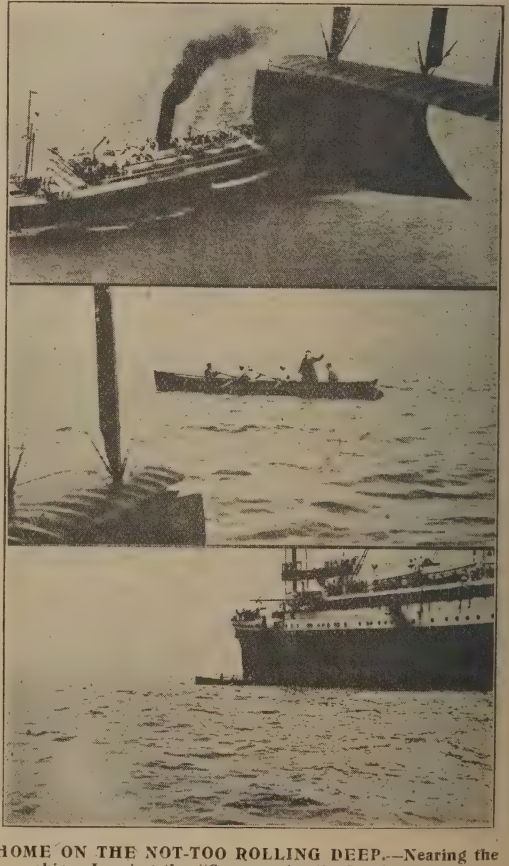
" 'Very satisfied indeed, and we shall send our goods by air more and more. Summer is coming on, and our customers will more frequently ask for air delivery. We are very satisfied indeed, and, as new services are opened, we shall use them, for, as you may know, we have customers in every corner of Europe.'

"Once more I was satisfied. I had again met some one who spoke the same language as did I."

## A QUIET LIFE.

Some time before Christmas last an American young woman, wishing for some curious reason to leave Bermuda (which is a British Possession) for her own country, allowed the regular steamboat to depart without her. She left Bermuda shortly afterwards in a Supermarine flying-boat belonging to the Bermuda and West Atlantic Aviation Company Limited. On overtaking the steamboat the Supermarine flew round it and alighted, whereupon the damsel was transferred to a row-boat and thence to the steamer. The stages of transfer are shown in the pictures below.

The newspaper account which appeared in the *Daily Mail* says that there was a heavy sea. The photographs do not seem to agree with this statement. The damsel, who is a cinema artiste, alleges that this was the most thrilling of all her exploits. One congratulates her on having led such a quiet and retired life. One would have thought that her method would have been to drop from the Supermarine into the rigging, or funnel, or whatever these sailor-people call it.



HOME ON THE NOT-TOO ROLLING DEEP.—Nearing the ship. Leaving the "Supermarine." Going aboard.

THE AIRCRAFT DISPOSAL COMPANY, LIMITED, beg to state that they hold large stocks of British Aircraft and Aviation Material, high grade Aero Engines and Engine Spares, Instruments, Accessories, and General Engineering Supplies for IMMEDIATE DELIVERY.

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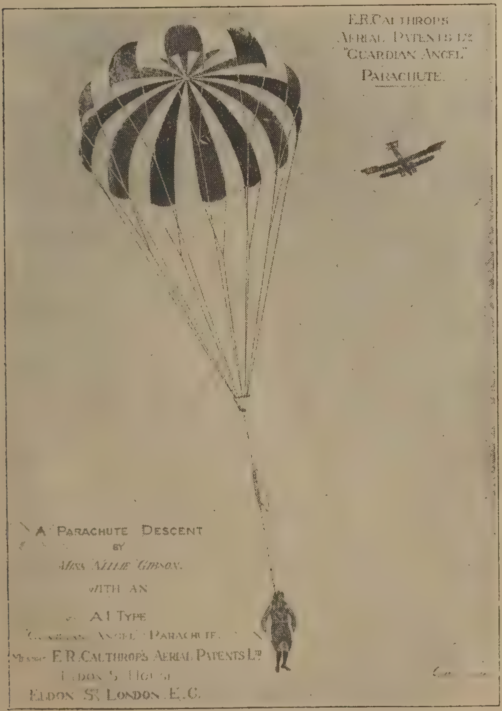

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We shall be pleased to quote for special parts turned from the bar. Send your inquiry direct to us, and it shall have our prompt attention.

# FOREIGN INTELLIGENCE.

## CZECHO-SLOVAKIA.

An aerial mail service between Prague and Warsaw was established on April 23rd by the Franco-Roumanie Co., with which the Henry Potez firm is associated.

## GERMANY.

A correspondent of The Aeroplane in Berlin writes :—

### New Mail Services.

The Lloyd "Ostflug" Society has opened up a mail service from Berlin to Konigsberg, which leaves Berlin at 8 a.m. and Konigsberg at 2.55 via Danzig, and the Deutsche Luftreederei has also instituted regular postal transmission from Danzig to Memel via Konigsberg. So far only ordinary mail and no parcels are carried, but the service is to be extended in a few days' time for this as well.

### The Inter-Allied Commission and Germany.

An exchange of notes has taken place between the Inter-Allied Air Control Commission in Berlin and the German Foreign Office on the contrasting standpoints of the Supreme Council and German Government with reference to the construction of civilian aeroplanes. The Germans replied to the proferred inquiry by saying that their conception of the situation has not changed and they cannot acknowledge the right of the prolongation after July 10th, 1920, of the construction embargo, as it runs counter to the provisos of the Versailles Peace Treaty.

In their note of December 14th, 1920, the German Government proposed to the Allies to place the matter before a tribunal, but no reply was made to this proposal, which is therefore now repeated under date of March 26th, 1921. The Foreign Office has requested the Control Commission to bring the matter forward once again and direct the attention of the Council of Ambassadors to the convocation of a tribunal of neutrals.

Meanwhile Minister-President Briand has informed the German Peace Delegation in Paris that the Council of Ambassadors will not consent to a new discussion on the subject, which means a new series of notes. How the world, and the diplomatic world above all, ever managed to exist in prewar days without the concoction of notes for and against most of the objects on this hapless earth it is difficult nowadays to conceive.

### Zeppelin Hangar Demobilised.

The Zeppelin hangar at Konigsberg-Amalienau, one of the most up-to-date and largest of all the German sheds, is in course of demolition. All precautions are taken, as the ghastly accident at Juterbog, which resulted in the deaths of several workmen, and grave injuries to others, is still green in our memories.

### Air Lines and Trade Fairs.

All aerial lines led to Leipzig during the Spring Fair, and postal and passenger service went on with the regularity of clock-work and without any rude interruptions in the way of atmospheric antagonism or accidents. The Rumpler Company intend to keep their service which led from Berlin to Leipzig with auxiliary connections to Nurnberg, Munich and Augsburg on as a permanency, starting from Berlin daily at 8 a.m., and arriving at 2.40 p.m. in Augsburg.

The Breslau Fair will also be the centre for a number of temporary services, and one learns that the Badenian Air Traffic Co. is now re-instituting its regular daily point-to-point service.—S. B.

## HOLLAND.

### The Air Port of Rotterdam.

The city of Rotterdam, the expansion and significance of whose docks will in every respect bear comparison with any other port of the world, realised in 1919 that account would have to be taken of the rapid growth of aerial traffic if the city was to maintain its position as a centre of international traffic in the future.

Although it was apparent that traffic by air will still have to be developed in many directions, the City Council was of opinion that in order to enable Rotterdam to be included in the network of air routes the laying out of an aerodrome ought not to be delayed.

By a resolution passed at a meeting held on Oct. 8th, 1919, the City Council selected in principle a site for the purpose lying south of the Waal Dock, at a distance of about 5 kilometres from the centre of the city. The level of this piece of land had already some years previously been raised to the requisite height.

On Dec. 4th, 1919, the Council voted the sum of F.450,000 for the purpose of commencing the preliminary work of laying out the aerodrome and the construction of roads.

The levelling, draining and sowing of the site—the area of which is 750 x 1,000 metres—undertaken by the Netherlands Moor Lands Reclamation Company, was completed in June, 1920. On July 26th the first aeroplane of the Royal Aerial Navigation Company of the Netherlands and Colonies (K.L.M.) landed on the aerodrome to pick up the London mail.

In the meantime the elaboration of the plans for the complete equipment of the aerodrome was being proceeded with. A study of aerodromes abroad having been made, the City Council, on Aug. 26th, 1920, voted a further credit of F. 863,000. The following buildings are now in course of construction : Two hangars, 22 x 38 x 11 metres and 24 x 50 x 6 metres respectively, with adjoining workshops; office for the management, in which meteorological and medical services will also be accommodated; a restaurant for the convenience of aerial travellers, together with sleeping accommodation, and baths on the upper storey of the building; a Customs house with residential quarters for officials; wireless telegraph and telephone hut; motor garage; a porter's shelter, and a store for aeroplane spares.

The aerodrome can be illuminated at night, provision is made for motor spirit storage and wireless plant, including a complete direction finding apparatus, is being installed.

The execution of the works described above is proceeding apace so that by the Summer of 1921 Rotterdam will be in a position to offer all the facilities which may be demanded of a centre for international aerial traffic.

It may be stated that the Rotterdam Municipal Aerodrome is one of the stations on the air routes from the Netherlands to London, Paris, Brussels, Hamburg, and Dortmund, along which services will be inaugurated during 1921 by the Royal Aerial Navigation Company for the Netherlands and Colonies.

## SWITZERLAND.

### "Guardian Angels" in Switzerland.

Immense interest has been roused in Lausanne by the visit of Mr. Piercy, flying a Martinsyde of the Aircraft Disposal Company, and of Major Orde Lees with his inseparable companion, the "Guardian Angel" parachute. The latter is the centre of attraction, and was introduced to the Swiss on April 10th at a big meeting at La Blecherette, Lausanne, organised by M. Pethoud, owner of *l'Ecole Aéro.*

The meeting opened with stunting on the school's Avro and on an Hanriot "Scout" by M. Johner, a Swiss instructor. Then Mr. Piercy delighted the crowd, some 20,000 strong, by some fine stunting on the Martinsyde, which, in his hands, gave an excellent account of itself. The principal item then came along when Mr. Piercy took off in the school Avro with Major Orde-Lees and parachute as passenger—an all-English combination. The somewhat volatile crowd was amused at the parachutist's unostentatious and businesslike preparations. The day was grey and calm, and a fine descent was made from 1,200 ft., Major Orde-Lees landing in the aerodrome "on his feet, with his felt hat in his hand."

The following Sunday he repeated his success at a meeting at Geneva, where in spite of driving snow he dropped from the Avro at a height of 500 feet.

M. Pethoud is organising meetings at Berne, Bale, Zurich, etc., and Major Orde-Lees is expected to remain a month.—

—E. B.

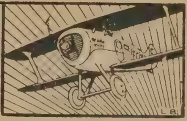
## SWEDEN.

### The Norrlandska Luftrederiet.

The Norrlandska Luftrederiet, who during the latter half of last year purchased two Sopwith "Doves" and one "Gnu," have had some very bad luck. M. Andree, a Swedish pilot completely wrote off one "Dove" in a forced landing. The other "Dove" made quite a lot of money in the south of Sweden, but when it came to fitting skis on it was found that they could not be made long enough to prevent the machine from sinking into the snow. After two attempts it was decided that it was not worth while risking the machine any further, so that it is out of action until the ice and snow have gone, when the wheels will be used. The "Gnu" has also done very well, but owing to its pilot, Major Johnston, having to go to England in order to obtain some spares, M. Andree took it over for a week and executed a landing on a ploughing machine in mistake for a landing Tee. After being repaired it developed a leak in the petrol tank whilst passenger flying in the North, and before Major Johnston, who had then returned, could get the machine down, it caught fire and was reduced to produce.

They are now looking round for two good seaplanes or flying boats for the summer.

# COMMERCIAL AERONAUTICS AND CIVIL AERIAL TRANSPORT.



## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### OFFICIAL NOTICES.

No 34, April 16th, 1921.—Summer time, 1921: Holland.

No 35, April 15th, 1921.—Aerodromes for Civil use: Amendments.

No. 36, April 22nd, 1921.—France: Enlargement of Aerial Corridor; Aerodromes, etc. Gives details of the increase of coastline over which machines may enter or leave France on the Channel route. New aerodromes for Civil use.

No. 37, April 22nd, 1921.—Denmark: Copenhagen Seaplane Station.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS:—B.C.—Bristol Aeroplane Company. F.R.—Franco-Roumanie G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line K.L. Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes. M W.—Marconi Wireless Telegraph Co. Ltd. N.L. Nordiska Luftrederi Aktiebolaget P.L. Petters Ltd. S.F. Surrey Flying Services. S.N. Syndicat National pour l'Etude des Transports Aeriens (S.N.E.T.A.). C.A.—Department of Civil Aviation.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

APRIL 25th:

K.L., Fokker, H-NABM, London-A'dam, 08-45-13.52, G., Nil, Holmes.
I.L., Vimy, G-EASI, London-Paris, 13.35-16.10, M., 11, Barnard.
K.L., Fokker, H-NABH, London-A'dam, 14.55-18.50, G.M., Nil, Duke.
M.A., Spad, F-CMAY, St. Ing.-London, 11.05-14.30, G., Nil, Le Sec.
M.A., Breguet, F-CMAK, St. Ing.-L'don, 11.05-14.45, Nil, Nil, Charpentier
G.E., Goliath, F-GEAD, Paris-London, 12.45-16.57, G.M., 11, Favreau & 1
M.A., Breguet, F-CMAJ, St Ing.-London, 14.40-15.53, Nil, Nil, Rauge.
S.N., DH9, O-BEAU, St. Ing.-London, 14.45-15.55, G., Nil, Sahnovsky.
M.A., Salmson, F-CMAE, Paris-London, 15.10-17.20, G., Nil, Le Men.

APRIL 26th:

G.E., Goliath, F-GEAD, London-Paris, 12.41-15.40, G, 11, Favreau & 1.
M.A., Breguet, F-CMAJ, London-Paris, 12.53-15.45, Nil, 3, Rauge.
B.A.. Bristol, M-AEAA, London-Paris, 13.08—, Nil, Nil, Uwins.
M.A., Spad, F-CMAY, London-Paris, 13.09-15.30, G.. Nil, Le Sec.
S.N., DH9, O-BEAU, London-Brussels, 13.14—, G.M., 1, Sahnovsky.
K.L., Fokker, H-NABG, London-A'dam, 13.30—, G.M., 2, Olley.
I.L., Vimy, G-EASI, Paris-London, 11.15-14.05, Nil, 11, Barnard.

APRIL 27th:

I.L., DH18, G-EAUF, London-Paris, 12.59-15.35, G.M., 8, Chattaway.
G.E., Goliath, F-FHMY, Paris-L'don, 12.54-15.28, G.M., 7, Labouchere & 1
M.A., Spad, F-CMAV, Paris-London, —15.35, G., Nil, Malfanti.
S.N., DH4, O-BADO, Brussels-London, 15.03-17.17, G.M., 2, Wouters.
K.L., Fokker, H-NABM, A'dam-London, —17.05, G.M., Nil, Holmes.

APRIL 28th:

K.L., Fokker, H-NABM, London-A'dam, 10.42-15.40, G.M., 3, Holmes.
G.E., Goliath, F-FHMY, London-Paris, 12.52-15.53, G., 8, Labouchere & 1
S.N., DH4, O-BADO, London-Brussels, 12.40-15.45, G.M., 2, Wouters.
M.A., Spad, F-HMAV, London-Paris, 12.45-15.14, 2, Malfanti.
I.L., DH18, G-EAUF, Paris-London, 11.15-13.40, G., 4, Chattaway
M.A., Spad, F-CMAY, Paris-London, 12.32-14.53, G.M., Nil, Le Sec.
G.E., Goliath, F-GEAC, Paris-London, 12.59-15.48, G., 12, Favreau & 1.
K.L., Fokker, H-NABG, A'dam-London, 14.00-16.48, G.M., 1, Duke.

APRIL 29th:

K.L., Fokker, H-NABG, London-A'dam, 10.25-16.15, G.M., 2, Duke.
I.L., DH18, G-EAUF, London-Paris, 12.29-15.10, G.M., 6, Powell.
M.A., Spad, F-CMAY, London-Paris, 12.30-15.32, G., Nil, Le Sec.
G.E., Goliath, F-GEAC, London-Paris, 12.45-16.05, G., 7, Favreau & 1.
C.A., Viking III, G-EAUK, London-Paris, 15.00-18.20, Nil, 1, Cockerell.
G.E., Goliath, F-FHMU, Paris-L'don, 12.50-15.15, G.M., 9, Labouchere & 1
S.N., DH4, O-BADO, Brussels-London, 12.11-14.15, G.M., 2, Delzenne.
K.L., Fokker, H-NABM, A'dam-London, 14.05-16.40, G.M., Nil, Olley.

APRIL 30th:

K.L., Fokker, H-NABM, London-A'dam, 10.05-14.40, G.M., 1, Olley.
S.N., DH4, O-BADO, London-Brussels, 12.36-15.33, G.M., 1, Delzenne.
G.E., Goliath, F-FHMU, London-Paris, 12.54-15.55, G., 12, Labouchere & 1
I.L., DH18, G-EAUF, Paris-London, 11.20-13.48, G., 2, Powell.
M.A., Breguet, F-CMAF, Paris-London, 12.55-15.30, G.M., 2, Malfanti.
C.A., Viking III, G-EAUK, Paris-London, 13.05-15.45, Nil, 1, Cockerell.
K.L., Fokker, H-NABG, A'dam-London, 14.50-17.00, M., 4, Holmes.

MAY 1st:

M.A., Breguet, F-CMAF, London-Paris, 11.25-13.45, G., 2, Malfanti.
S.N., DH9, O-BIEN, Brussels-London, —16.56, G.M., Nil, Catta.

### The Air Port of Cricklewood.

APRIL 25th:

H.P., HP, G-EATN, Paris-London, 11.30-14.45, Nil, Nil, 9, McIntosh & 1.

APRIL 26th:

H.P., HP, G-EATK, London-Paris, 11.55-14.55, G.M., 10, Wilcockson & 1

APRIL 27th:

H.P., HP, G-EATK, Paris-London, 11.00-14.05, G., 7, Wilcockson & 1.

APRIL 28th:

H.P., HP, G-EATN, London-Paris, 11.55-15.25, G.M., 10, Wilcockson & 1.

APRIL 29th:

H.P., HP, G-EATN, Paris-London, 11.04-14.20, G., 9, Wilcockson & 1.

APRIL 30th:

H.P., HP, G-EATM, London-Paris, 12.00-15.05, G.M., 10, McIntosh & 1.

### Inland Flying at Croydon.

April 25th.—Nil.

April 26th.—S.F., Avro joy-rides (Muir); I.L., "Bat" Hendon return (Barnard).

April 27th.—S.F., Avro joy-rides (Muir).

April 28th.—S.F., Avro joy-rides (Muir).

April 29th.—S.F., Avro joy-rides (Muir); I.L., "Vimy" Northolt return (Barnard); C.A. Westland to Yeovil (Payne).

April 30th.—L.A., DH6, and Avro Leatherhead return and joy-rides (Knowles and Hayns); S.F., Avro joy-rides (Muir); I.L., "Bat" Northolt return (Chattaway); D.H.4, from Northolt (Barnard).

May 1st.—L.A., Avro joy-rides and Leatherhead return (Hayns); S.F., Avros, joy-rides (Muir); I.L., "Vimy," test (Barnard).

### Inland Flying at Cricklewood.

April 25th-28th.—Nil.

April 29th.—H.P., O/10, test (McIntosh)

April 30th-May 1st.—Nil.

### Air Port Statistics.

Machines, 52; Passengers, 206; Crew, 66; Total Personnel, 272.

### The London Terminal Aerodrome.

*Apropos* nothing at all, imitation still is, as it always has been, the sincerest form of flattery.

Another very busy week at Croydon Mr. Barnard took the Instone "Vimy" to Paris on Monday and returned on Tuesday. Mr. Chattaway was on a D.H.18 on the same route on Wednesday and Thursday, and Mr. Powell took over the same machine at the end of the week.

Mr. Barnard flew to Northholt on the "Vimy" on Friday to see the progress of the D.H.4 and returned later.

On Friday Messrs. Cockerell and Broome left for Paris via the Thames at Westminster on "Viking III." The "Goliaths," Bréguets and Fokkers are all going very strong and the S.N.E.T.A. machines are going too.

This week Messageries Aériennes are running a twice-daily service to Paris, leaving now at 10.00 hrs. and 16.00 hrs., so that now there is a continual string of arrivals and departures throughout the day.

Mr. Muir, who has now Mr. Grant back, flew with Miss Finet to Brighton and back last Friday.

The Surrey Flying Services are going very strong just now, and it is quite possible that Mr. Muir will carry out exhibition flying at the Crystal Palace during the coming summer.

Airship G-FAAG visited the aerodrome on Friday night and both ship and aerodrome treated one another to a mutual firework display, after which the airship went on a lighthouse inspection tour round Southern England and Northern France. The last time G-FAAG was over London she did not carry her official lettering. Is the Department of Civil Aviation exempt from its own laws?

On Saturday the usual air-line machines departed and arrived, despite heavy rainstorms during the afternoon. By good luck the machines arriving from the Continent all managed to get in between storms. A certain amount of comic relief was afforded by an R.A.F. pilot, with Lieut.-Col. Blandy of the Communications Section of the Department of Civil Aviation in the compartment for passengers on a D.H.9a. After surveying the aerodrome from a height of several thousand feet, presumably in order to see which way the "stocking" was blowing, instead of landing over the lighthouse against the wind, he came in across Plough Lane low down behind the hay stacks, doing quite an elegant cross-wind slide-slip. Unfortunately he found the ground rather too hard for his undercarriage and alighted gracefully on the crank-case of his engine amid much rending of timber.

Subsequent examination by pilots and mechanics revealed a patch of dry-rot in the timber of one undercarriage strut, and this was held to exonerate the pilot from responsibility for the crash. The machine bore on its wing-struts the transfer of the Westland Works, and one would scarcely accuse this firm of using dryrotted timber. The assumption therefore is that the undercarriage had been at some time added to the machine after a previous subtraction, or else that the machine had been assembled originally at one of those amazing war-time Delivery Parks in which any old stuff from any old factory might be assembled together with other products turned out most scrupulously by the best firms.

However, neither the pilot nor his distinguished passenger suffered the least damage in this episode.

Mr. Barnard and Mr. Chattaway and some mechanics left at 13.30 on the Instone "Bat" to fetch the firm's D.H.4 from Northolt, where it had been under repair. Mr. Chattaway flew back on the D.H.4, the two machines arriving together.

Mr. Muir on the Surrey "Avro" was quite busy most of the afternoon in spite of the weather, and Mr. Hayns on the Leatherhead "Avro" also took up a number of passengers. On arriving from Leatherhead, Mr. Hayns put up a good show of looping and rolling.

Late in the afternoon the Vickers "Viking" arrived with Lieut.-Col. W. D. Beatty as passenger, piloted by the "Heavenly Twins," Messrs. Cockerell and Broome, General Sykes having remained in France The machine, which, unlike the R.A.F. machine, made a most successful side-slip approach to the aerodrome, left the Seine about the same time as one of the Brēguets left Le Bourgêt, and the Brēguet arrived shortly before the Viking, so presumably the amphibian was merely touring and not hurrying.

An evidently un-aeronautical correspondent of the *Morning Post* stated recently that the Vickers "Viking" G-EAUK, more commonly known at Croydon as the "Thames Express," has been lent to the Instone Air Line for London-Paris work. One has it from the Air Ministry that this statement is absolutely untrue, the machine being in fact intended for Air Ministry experimental work. Apparently there is a good deal of experimental work to be done before a Thames-Seine Service can be established by even a subsidised firm.

The same un-aeronautical correspondent of the *Morning Post* was responsible for the statement that the Fokker firm is running a line from Croydon. It was not surprising that Mr. Leverton should arise and slay him (metaphorically) in the *Post*, and explain that the great K.L.M. is not by any means a Fokker line.

Sunday's performances were as usual on Sundays, and on Monday the Instone "Vimy" took twelve passengers to Paris.

During last week the public cattle-pen has sprouted a useful but spikey off-shoot into the aerodrome.

### Northolt.

All those who admire real determination will be glad to hear that the Central Aircraft Company are still continuing to take an active interest in aviation. The firm is still doing aircraft work and is keeping the Northolt Aerodrome going. The firm has some contracts in hand, and is also doing sub-contract work.

Though there can be naturally but few men who want to learn to fly in this country, seeing that several generations of probable pupils were taught to fly all at once during the war, the firm still manages to keep its flying school going and, so far as one can discover, it is actually the only Civil Aviation School actively employed at the moment.

What the brothers Cattle do not know about timber is hardly worth knowing, as they have been concerned with joinery work and engineering timber work for many years. Therefore it is not surprising that their wood-work has been remarkable for its excellent quality. Consequently the Central Aircraft Company can be safely recommended to anybody who wants careful and accurate aircraft work done, whether the purchaser desires to buy a machine of the Central Aircraft Company's design or whether he wants a design of his own produced or merely wants a re-build done.

## AIR LINE DELAYS.

Sir,—I was surprised to notice during a visit to Croydon Aerodrome this week that in spite of several warnings in the daily Press the Air Transport firms are not sending their machines off to scheduled times. In nearly all cases the machines leave at least a quarter of an hour late—which delay not only irritates the passengers, but also detracts from the time-saving advantage which they pay for, and expect. Surely this simple matter can be remedied.

Redhill, April 30th. (Signed) L. Anscombe.

## WHITEHEAD'S AND HOTHEADS.

On Wednesday of last week I went to see "Robey en Casserôle" at the Alhambra. The next day I went to a Creditors' Meeting of Whitehead Aircraft (1917) Ltd. at Richmond. The acting at the latter was clever, though there was no one comedian in the show with the personality of Mr. Robey. However, both were well worth seeing.

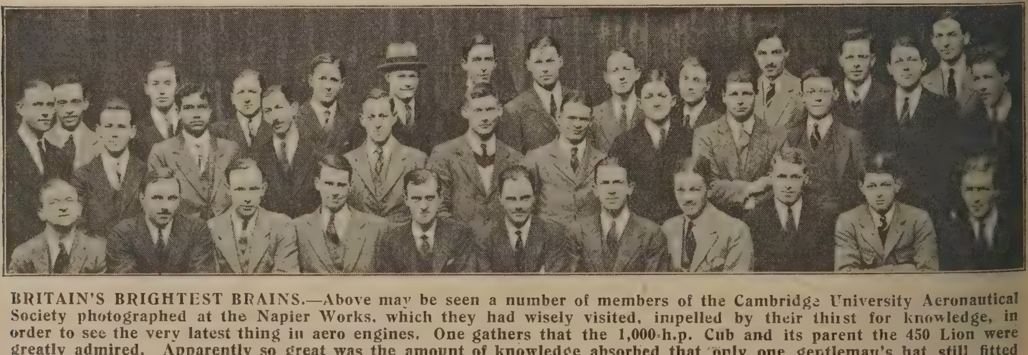
After a brief survey of the Richmond works, now under a heavy cover of rust and dust, we were told to go into a neighbouring hostelry, where lunch would be provided. After waiting for some time, with no solid or liquid result, I decided to go in a friend's car into Richmond for lunch, since it had been previously given out that those present were to be transported to the Whitehead aerodrome at Feltham, where the meeting was to take place at 14.00 hrs.

On arrival at the Whitehead aerodrome there was no sign of the 'buses carrying the creditors, but one or two other wise souls had made their own way in their cars. After a cursory glance round the works (which one believes only produced one original machine, to wit, the "Whit'ead" machine in a musical comedy called "Going Up," at the Gaiety Theatre) we got impatient and 'phoned Richmond to know what had happened. We found out that the remaining creditors had flatly refused to go to Feltham and so the meeting was being held at Richmond.

Back we raced as fast as the Lancia would go and arrived just in time for the close of what, judging from the hotness and crossness and bunness of the principals, had been a very stormy meeting.

I gathered afterwards that the chairman, now no longer Mr. J. A. Whitehead, opened his speech by stating that the last time he had had the misfortune to speak to the founder of the firm he had been called a fool (with blood, *vide* "Dracula") and therefore it was as a fool (with blood) that he was now in charge of the meeting.

During the course of the meeting there were several similar graceful tributes paid and the net result of a very perfect day was to appoint a committee of inspection to inspect an already formed committee of inspection who have for some time been inspecting what prospects may be expected of the creditors ever seeing anything of their just rights.—G. D.



**BRITAIN'S BRIGHTEST BRAINS.**—Above may be seen a number of members of the Cambridge University Aeronautical Society photographed at the Napier Works, which they had wisely visited, impelled by their thirst for knowledge, in order to see the very latest thing in aero engines. One gathers that the 1,000-h.p. Cub and its parent the 450 Lion were greatly admired. Apparently so great was the amount of knowledge absorbed that only one gentleman's hat still fitted him after the view. Somehow the serried ranks of intelligent young visages reminds one of that ancient song "All the little pansy faces." It is good to find that the younger members of our Universities are taking an intelligent interest in the locomotion of the future.

# PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]

### IN MEMORIAM.

RHODES-MOORHOUSE.—In proud and most loving memory of Lieut. William Barnard Rhodes-Moorhouse, V.C., Royal Flying Corps, who died at Merville, in France, on April 27th, 1915, from wounds received the day before while dropping bombs on Courtrai Junction.

### ENGAGEMENTS

DAVISON—CARMICHAEL.—The engagement is announced between Mr. J. F Davison, M.C., late R.A.F., elder son of Colonel T. Davison, late 10th Lancers, and Mary, youngest daughter of the late Mr. William Chalmers Carmichael, of Pietermaritzburg, Natal, South Africa, and Mrs. Carmichael, of Innellan, Pietermaritzburg, and 130, Earl's Court Road, London, W.8.

HUGHES—VIDAL.—An engagement is announced between Geoffrey Forrest, only surviving son of Sir Thomas and Lady Hughes, Sydney, N.S.W., and Margaret Eyre Sealy, younger daughter of the Rev. G. S. S. and Mrs Vidal, Barnsley Rectory, Cirencester.

KENNEDY—DOUNES.—The engagement is announced between Quinten Alexander Kennedy, R.A., and R.A.F., eldest son of Quinten W. Kennedy, and Mrs. Kennedy, of Franfort, Merrion, County Dublin, and Doris Dounes, only daughter of the late Percy Dounes and Mrs. Walter Meyrick, of Sudbrooke House, Sudbrooke, Lincoln.

MOLLER—KERR.—The engagement is announced of Flying Officer Christopher W. H. Moller, R.A.F., eldest son of Mr. W. H. Moller, of Santfoins, Cambridgeshire, and Elizabeth Maud Gwynnedd (Betty), eldest daughter of Mr. and Mrs. Kerr, of Maesmor, Denbighshire, and Faldonside, Cromer, Norfolk.

MONK—WAUD.—The engagement is announced between Harold Henry de Baillou Monk, M.C., A.F.C., son of the late Lieut.-Col. Charles Monk, I.A., and the Vicomtesse de Baillou, 126, Lexham Gardens, W., and Ethel Carine, elder daughter of Mr. and Mrs. George C. Waud, Ferniehurst, Baildon, Yorkshire.

RICHARD—BARRY.—The engagement is announced between Major Leslie F. Richard, R.A. and R.A.F. (retired), son of the late Walter M. Richard and Mrs. Richard, 29, Chester Street, Edinburgh, and Audrey, younger daughter of Mr. and Mrs. Douglas H. Barry, 1, Collingham Gardens, S.W

SHADWELL—TARRING.—A marriage has been arranged and will take place at 2.15 on June 4th at St. Mark's Church, Surbiton, between L. M. Shadwell (late R.A.F.), second son of Julius Henry Exham Shadwell, of Surbiton, late of Horfield, Gloucestershire, and Elizabeth Vida Holmes, only child of Bateman Brown Tarring, O.B.E., and Mrs. Tarring, of 28, Claremont Road, Surbiton.

### CORRECTION.

LOCKE-WATERS—DREW.—The engagement is announced between Flying Officer E. A. Locke-Waters, R.A.F., only son of the late Major G. H. A. Locke-Waters, of Cape Town, South Africa, and Elfreda Joanna, younger daughter of Mr. and Mrs. Drew, of Burnage, Manchester. [Errors were made in the names published last week.—Ed.]

### MARRIAGES

LAMBERT—RUTTER.—On April 21st, at St. Stephen's Church, West Ealing, by the Rev. Montague M. Pope, Flying Officer R. D. Lambert, R.A.F., to Mabel, only daughter of Mr. and Mrs. Wm. Bourn Rutter, Holmbury, Mortimer Road, Ealing.

LONGCROFT—HEPBURN.—On April 27th, at St. Paul's Church, Portman Square, very quietly, by the Rev. B. W. Keymer, O.B.E., R.A.F., Air Commodore Charles A. H. Longcroft, C.M.G., D.S.O., A.F.C., R.A.F., of Llanina, Cardiganshire, to Marjory, widow of Captain W. D. Hepburn, Seaforth Highlanders, and daughter of Mr. and Mrs. J. W. McKerrell-Brown.

MARSDEN—JARVIS.—On April 2nd, at St. Paul's Church, Hammersmith, by the Rev. G. L. Walsh, M.A., Rural Dean, Charles Cyril, late of the R.F.C., only son of Mr. and Mrs. Charles Marsden, of Standish Road, Hammersmith, to Gertrude Kingston, only daughter of Mr. Thomas Jarvis, of Rowan Road, Brook Green, W.6

STOCKDALE—FANNIN.—On Sunday, Feb. 13th, at St. Cyprian's, Durban, by the Lord Bishop of Natal, Captain Walter Stockdale, D.F.C., son of Mr. and Mrs. H. W. Stockdale, of Alma Clocolan and Pietermaritzburg, to Norah Eustace, daughter of the late Judge Fannin and of Mrs. Fannin, of Pietermaritzburg.

### BIRTHS.

BABINGTON.—On April 17th, at 20, Talbot Square, the wife of Sqdn. Leader John T. Babington, of a daughter.

GARROD.—On April 14th, at Aberdour, Fife, to Evelyn, the wife of Sqdn.-Leader A. G. R. Garrod, M.C., D.F.C., R.A.F.—a son.

DE COURCY.—On April 2nd, at Park Tower, Ryde, I.W., the wife of Squadron Leader John de Courcy, Royal Air Force, of a daughter.

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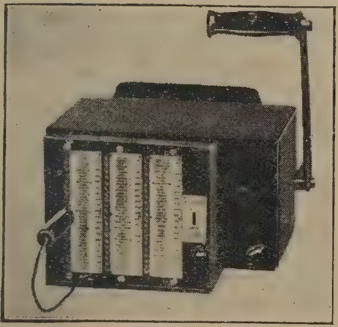

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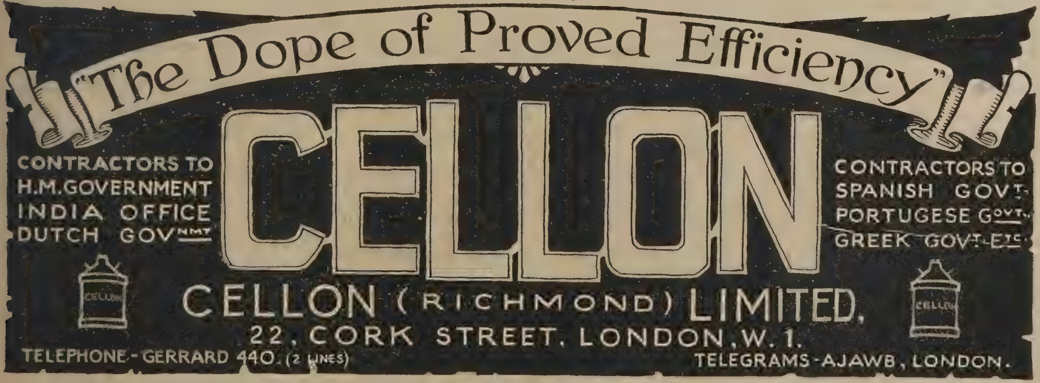

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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... 423
Aircraft Disposal Co., Ltd., The ... 423
Armstrong Siddeley Motors, Ltd. ... 421
Arrol-Johnston, Ltd. ... *Front Cover*
Auster, Ltd. ... *Front Cover*
Automatic Telegraph Co.... 427
Beardmore Aero Engines, Ltd., The *Front Cover*
Boulton & Paul, Ltd, ... 419
Bristol Aeroplane Co., Ltd. ... 421
British Thomson-Houston Co., Ltd., The ... 414
Calthrop, E. R., Aerial Pat., Ltd. ... 423
Cellon, Ltd. ... 427
Cunard Line ... 428
De Havilland Aircraft Co., Ltd., The... 414
Fairey Aviation Co., Ltd., The ... 411
Hancock, James Lyne, Ltd. ... 428
McGregor, Gow, & Holland, Ltd. ... 427
Metal Airscrew Co., Ltd.... *Front Cover*
New Pegamoid, Ltd. ... 428
Nieuport and General Aircraft Co., Ltd. *Back Cover*
Roe, A. V., & Co., Ltd. ... *Inside Front Cover*
"Shell" Marketing Co. ... 417
Short Bros., Ltd. ... *Back Cover*
Titanine, Ltd. *Front Cover & Inside Back Cover*
Westland Aircraft Works... 413

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# ON PASSENGER-WORTHINESS.

So far, by an extraordinary combination of good judgment and good luck, there have been very few accidents indeed to passengers on the cross-Channel air lines. But absence of accidents is no reason for neglecting to take every precaution against the happening of accidents. And it is evident that all possible precautions are not taken. Therefore one directs the attention, primarily of the Department of Civil Aviation, and secondarily of the operators of air lines, both British and foreign, to certain points which deserve more consideration than they seem to receive.

## The Safety of Passengers.

Every British machine which carries passengers has to have an Airworthiness Certificate, under dire pains and penalties to the owners and operators. These certificates are only granted by the Air Ministry after the most careful inspection by the officials of the Aeronautical Inspection Department, so ably controlled by Brig.-General Bagnall-Wild and his chief henchman Lieut.-Col. Outram. When a machine has an Airworthiness Certificate and is maintained up to the standard of that certificate it is about as safe, so long as it is in the air, as a ship which is certified A.1 at Lloyd's.

But that certificate is not any guarantee that the same machine is Passengerworthy. It may be perfectly safe in the air and yet an absolute death-trap if forced to descend against the pilot's will on bad ground or in water.

Accidents happen in the best-regulated families and even in concerns run by British business men. This fact is recognised by Public Authorities of greater age than is the Air Ministry. An architect may design a perfectly fire-proof theatre in theory, but that does not prevent the London County Council and the various provincial authorities from insisting that those same theatres shall also have emergency exits, the position of which shall be notified to audiences in the most prominent possible manner. Also, the same architect's stairs may be amply strong for their load, but the local authorities insist also that they shall not be such as to be dangerous in case of panic because of awkward corners or of difficulties of egress.

## Unwarranted Fears.

Yet these regulations and illuminated notices of emergency exits do not cause people to stay away from theatres for fear of fire and panics. Rather they tend to make people happier when in the theatre because they know that their safety is assured by a watchful authority. Similarly the alarm signal in a railway carriage does not inspire fear of assault, it merely gives confidence to nervous passengers.

This is the reply to those who fear that further inspection regulations, or even discussion in this paper, may damage British Aviation or their own trade. In such matters as these, as in so many others, honesty is the best policy.

That being so, one suggests that the Air Ministry should devote very much more attention than it does to the Passengerworthiness of all aircraft which come under its control or which it can influence in any way. For undoubtedly many of the most airworthy aeroplanes of to-day are very far from being passengerworthy.

It is the duty of the Air Ministry to see to the physical and mental comfort of passengers quite as much as it does to the airworthiness of the machines. A ship may be perfectly seaworthy, but the Board of Trade will not pass it for passenger carrying unless it complies with all regulations for the reasonable comfort and safety of passengers under any conditions which it is likely to meet. It is quite time that the Air Ministry adopted a similar policy towards passenger-carrying aeroplanes.

## Neglected Precautions.

Hitherto nobody has planted a machine full of passengers in the Channel and so apparently nobody is very much concerned as to what would happen if such an accident occurred. The one thing that does seem certain is that there are no regulations of any kind as to the compulsory carrying of life-saving apparatus, such as the Board of Trade decrees for passenger-carrying ships. And yet such things exist.

Some pilots wear inflatable belts, some do not. Some firms are prepared to lend such belts to passengers, some are not. Some machines are provided with emergency exits, most are not. No machine is fitted with any kind of flotation apparatus, either integral with the machine or removable like rafts, except the tail-bags on the D.H.19. And very few air line managers or pilots take the trouble to tell passengers beforehand what to do in case of emergency. A letter published recently in this paper bears witness to this fact.

## A Little Knowledge.

The only knowledge available as to what would happen if an aeroplane should descend in the Channel is derived from a Handley Page belonging to the R.A.F. which came down in the Irish Sea off Holyhead a few months ago. As it was descending the wireless operator signalled the mishap and it took the British Navy about two and a half hours to cover some ten or twelve miles from Holyhead Harbour to the wreck. (Which is rather longer than the Navy took to cover the same distance from Kingstown to the torpedoed *Leinster* during the war.)

From this incident we learn that an ordinary Service Handley Page will float for two hours or more, for when help arrived the crew of the machine were sitting on the tail, which was the only part of the machine remaining above water. There seems no reason why a Commercial Handley Page should not float for as long a period. In fact it might possibly float longer if well filled with light goods in fairly watertight packages.

## The Need for Warning.

Also we know that the Commercial Handley Page has very adequate emergency exits in the roof of the cabin through which the passengers could easily climb onto the deck when the machine settled in the water. It is, however, very desirable that the existence of these exits should be made known to the passengers. It is true that neat little labels are fitted in the cabins giving instructions how to tear open the fabric panels which close these exits, but passengers making their first flights are generally far too excited, or far too interested in what is passing outside, to bother about reading notices inside.

If the passengers with the late Mr. Bager had known of these emergency panels, none of them need have been burned. As it was those who escaped did so by the laborious process of breaking open small glass and celluloid windows and climbing through them. Therefore it is evident that the passengers ought to be individually instructed concerning these panels before starting.

So far as one knows the only other machines which have proper emergency exits are the D.H.18s and some of the Bréguet. How useful they are in the former machine was shown when Mr. Cyril Holmes skilfully saved a bad smash by sitting a D.H.18 neatly down in a suburban garden near Croydon. The machine fell sideways so that the door was jambed, but the passengers merely trooped out through the roof. It takes little imagination to picture the horrors of a smash if a machine without emergency exits fell so that the door could not be opened and then caught fire.

## Water Dangers.

Very few aeroplanes, if any, have windows through which bulky people encumbered by overcoats could escape in a hurry even on the ground, and under water escape by such means would be almost impossible. Perhaps one or two very coolheaded individuals might get out, provided they were accustomed to diving and were not seized and held by their panic-stricken companions. But the odds would be against even those few extricating themselves.

A few days ago one watched three passengers getting out of a Fokker monoplane belonging to the K.L.M. One of them had thoughtfully equipped himself with an inflatable belt which he wore over a long and large leather overcoat. By no possible means could he have got through the window of the cabin against water pressure outside. And certainly the door could not have been opened against the external pressure of the water. Therefore one can only imagine that the inflatable belt was worn to give him moral rather than hydro-static support.

The Fokker monoplane would probably float for a long time on its wings, with the cabin entirely submerged. The pilot, sitting high up in front, would probably climb from under the leading edge of the plane without trouble. But one cannot see any possible escape for any passenger who is not gifted with the amphibious habits and physical sinuosity of Miss Annette Kellermann.

Yet there seems no reason, except lack of forethought on the part of the designer, why the whole top of the cabin should not be open into the wing between the spars. The roof of the cabin serves no useful purpose, except to make the air space smaller. The under surface of the wing, if its exists, does nothing. So the upper surface of the wing might just as well be the roof of the cabin, and in that upper surface there might just as well be a large panel which could be pulled down to provide an emergency exit. The petrol could be carried under the floor of the cabin.

### An Improved Method.

The Westland machine is a trifle better than most others, in that there is a possible means of escape through the pilot's cockpit at the back of the cabin. But presumably nobody knows for certain whether when once the machine was in the water the cockpit would be above or under the surface. If there is any knowledge on this point it would be well to publish it.

Even if the cockpit itself was above water it would take some time for five passengers to climb round the control-gear and out of so small an opening. And in the panic fear of drowning or of being burnt it is expecting a good deal to hope that each passenger would leave strictly in order of precedence without pushing or shoving or crowding Therefore even so good a machine as the Westland would be greatly improved by having adequate exits in the roof.

The latest six-seater Spad, a beautiful example of Mr. Herbemont's genius, suffers from the same defect, plus the still worse point that the door to the cabin is in front of the leading edge and close up to the engine, where it must be jambed in even a slight smash, and must be under water if it drops into the ditch.

The same remark applies to the Commercial "Vimy," emphasised by the statement that as the pilot sits in front and as the front of the machine would certainly go under water and stay there from the moment that the machine came to rest the passengers could not get out that way. It is, however, possible that because of its ply-wood body the machine might float with the back door above water long enough for the passengers to get out. But even if they did there is nothing to help them to climb onto the deck. It would be far better to provide several openings direct from the cabin onto the deck.

### A Useful Experiment.

Here again it would be of great value to have definite knowledge as to the flotation line of such a machine and one suggests that the Research Department of the Air Ministry might discover it experimentally. The R.A.F. has ordered a vast number of Commercial "Vimys" disguised as "troop-carriers." The R.A.F. thinks nothing of the expense of testing a complete machine to destruction under a sand load. Why should not the Royal Aircraft Establishment take one of these "Vimys" and lower it gently by means of a crane into Fleet Pond, to ascertain exactly how it floats when fully loaded?

The knowledge thus gained might save the lives of many people, "troops" and otherwise. And incidentally the machine would be little or none the worse for its wetting if carefully handled when in the water. One presents the idea with compliments to Mr. Sydney Smith of the R.A.E. in recognition of courtesies already received.

Even if the fuselage floated like a boat a heavy sea would soon smash the wings and turn the machine over. Therefore detachable rafts ought to be fitted in any case.

Nevertheless, quite apart from any question of flotation, there is in the "Vimy" as in nearly all other machines the same trouble that in case of a crash, like poor Mr. Bager's, followed by fire, if the machine falls on the side in which the door is fitted, and so makes it impossible to open the door, there is little chance for twelve people to get out of the windows, whereas all of them could quite easily fall out of big holes in the roof, and even the wounded could be hauled out easily.

### The Need for New Outlook.

Until lately the minds of designers have been entirely occupied with the design of war machines and so have thought of little but strength and performance. More recently they have got as far as thinking about economy in the carrying of loads and the bodily comfort of passengers as exemplified in the upholstery and warming of cabins. But few of them have apparently thought of even more important details such as would occur at once to any Board of Trade official who was accustomed to considering accidents on railways and on board ship.

A certain amount of attention has been given to the prevention of fire in the air or after a crash in landing. But here opinions are divided, as for example a story which is told of the Air Ministry Competition last year.

It is alleged that one Judge deducted all available marks from the Handley Page machine because its petrol tanks were on the wings in the engine-nacelles and so were too close to the engines. Arguing thus he gave full marks to the Vickers "Vimy" because its tanks were in the fuselage. Another Judge, so the story goes, deducted all the "Vimy's" marks because its tanks were in the fuselage under the passengers' cabin and gave full marks to the Handley Page because its tanks were out on the wings.

Where such good judges disagree, who shall decide? Nevertheless, there should be some decision on such a point as this, and it should be taken into consideration in estimating not only the airworthiness but the passengerworthiness of an aeroplane. But it would be better still if the Department of Supply and Research would make a real effort to discover a method of using heavy oil instead of petrol in existing engines and to encourage the production of an engine which would use crude oil as does a Diesel engine.

### Unfair Competition.

Yet another matter which affects the future of commercial flying deserves the immediate attention of the Department of Civil Aviation. It is an open secret that many foreign aeroplanes which are used for passenger carrying would never be granted airworthiness certificates by our Aeronautical Inspection Department. Yet British passengers are not only allowed to fly in such machines, they are actually obliged to fly in them by the fact that the existing temporary, but entirely foolish, subsidy scheme only allows our British air lines to fly one machine per day between London and Paris.

All the seats in this one machine per day are practically always booked several days ahead, and so passengers must either fly in foreign machines or not fly at all. And if they want to go to Brussels or Amsterdam they must either go in foreign machines or else go by rail and boat.

It is not within the power of the Air Ministry under the International Convention to insist that foreign machines plying for passengers in this country shall have British airworthiness certificates. But any foreign machine can have a British certificate by qualifying for it. And so far as one can see there is nothing to prevent the Air Ministry from insisting that anybody in this country who sells tickets for foreign air lines shall state plainly to the passenger whether the particular aeroplane concerned has or has not a British certificate of airworthiness and passengerworthiness.

If such a regulation were made every foreign air line which wanted business in Great Britain would very soon see to it that its machines were brought up to our standard of airworthiness and passengerworthiness, which at present some of them are most certainly not.

### Doubtful Cases.

For example one does not believe that any A.I.D official would pass some of the Belgian S.N.E.T.A. machines which one sees at Croydon. The S.N.E.T.A. people deserve every commendation for the good work they are doing in popularising aviation in Belgium and especially for their pluck in running their line from Brussels to London. But though they had the knowledge which impelled them to buy British aeroplanes their mechanical staff has very evidently not got the experience necessary to maintain those machines in proper flying condition. It is even said at Croydon that one of their pilots wanted a certificate from some British authority to show that his machine was not airworthy, so that if he had an accident he could prove that it was not his fault.

Also one doubts very much whether the A.I.D. would pass certain details in the Fokker monoplanes, as for example the fuselage bracings in which the two ends of a single wire are joined by a turnbuckle so that it looks as if there were a double wire bracing when in fact there is only a single wire. Also the method of lightening the four lugs which alone hold the machine to its wings might not meet with A.I.D. approval, seeing that the holes cut across the grain of the metal just on the line of pull. Furthermore, if passengerworthiness certificates were issued the cabin arrangement (as already stated) would certainly not be passed and the machine would also probably be refused a certificate on account of the very limited view allowed to the pilot.

The small Spad would certainly never be passed, on account

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*Etude et entreprise de la fourniture du matériel complet pour services de transport aérien rapide de passages, courrier et marchandises. Constructeurs des Fairey Type III. Série de machines fournies en grandes quantités au Gouvernement Britannique pendant la guerre et depuis la cessation des hostilités. Dans cette série de machines, le fuselage, le plan central et la queue, etc., sont standardises, et sont construits de manière à pouvoir recevoir des ailes des types différents, ainsi que des châssis et moteurs d'autres machines de la série, de manière à être appropriés à l'usage auquel la machine est destinée dans chaque cas particulier. Toutes les machines de cette série ont des ailes démontables et repliables, et sont munies de notre dispositif breveté de cambrure variable, qui permet les plus grandes performances et qui combine une grande puissance de soulèvement avec une faible vitesse d'atterrissage.*

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Diseñadores, á pedido especial del Gobierno Británico del barco aéreo mas grande que se ha construido para este gobierno.

Proveedores de todo lo necesario para servicios de transporte aéreo de pasajeros, correos y mercancías.

Diseñadores y constructores del tipo Fairey III. Serie de aparatos suminstrados en cantidad al Gobierno Británico, durante la guerra *y después de su terminación.* En esta serie de aparatos, el fuselage, el plano central y la unidad de la cola, son standard y fabricados para adaptarse á diferentes tipos de alas, chassis y motores de otros aparatos de series que sean adecuadas para ejecutar los fines particulares para los cuales se requiera el empleo del aparato. Todas las máquinas de este tipo, tienen alas plegadizas y eatán provistas del dispositivo patentado de combeo variable Fairey que da una alta performance y potencia de ascensión combinada con una velocidad baja de aterrisaje.

of the difficulty of getting in and out of the cabin, even when standing still on the ground. The limited view to the left might quite possibly bar the otherwise reliable "Goliath." And various other foreign machines would have difficulty in being passed as either passengerworthy or airworthy or both.

### The Simple Way Out.

Yet any foreign machine, far worse than any of those mentioned, is quite at liberty to carry British passengers, provided that it can obtain by any means a certificate in its own country. In the end, after there have been enough crashes on foreign machines, the value of the British air certificates will be recognised just as the value of a Lloyd's certificate is recognised by foreign ship-owners. But, meantime, the British aeroplane maker, owner, and operator is at a disadvantage. This disadvantage can be easily removed to a considerable extent if the Air Ministry will institute pssengerworthiness as well as airworthiness certificates or, alternatively, will insist that the necessary qualities of passengerworthiness shall be included in the airworthiness certificate, and if the Air Ministry will insist that passengers shall be told whether they are to be carried in a machine with a British certificate or not. It is the Air Ministry's duty not merely to legislate and administrate flying in Great Britain, but also to do its best to foster British Aviation and the British Aircraft Industry. One hopes that the suggestions made in this article will assist the Air Ministry in the two latter portions of its great task.—C. G. G.

## A NEW INTERNATIONAL CHAMPIONSHIP RACE.

In France there are still sportsmen and wealthy people who take a pleasure in being patrons of the sport of Aviation. The Gordon Bennett Cup, the race for which hitherto regarded as the International Championship, having been won outright by France last year, Madame Henry Deutsch de la Meurthe and her family have made the *beau geste* of presenting the sum of 200,000 francs for an international speed contest which will take the place of the race for the Gordon Bennett Cup.

This sum of 200,000 francs will be divided as follows: (a) An *objet d'art*, or as we should say a trophy, of the value of 20,000 francs, and (b) three prizes of 60,000 francs each to be awarded to the winners of the Cup in the form of cash prizes. The Cup shall be won outright by one competitor who has won the event twice, or, failing that, by the third winner. If the same competitor wins the first two contests that competitor shall receive the third remaining prize of 60,000 francs.

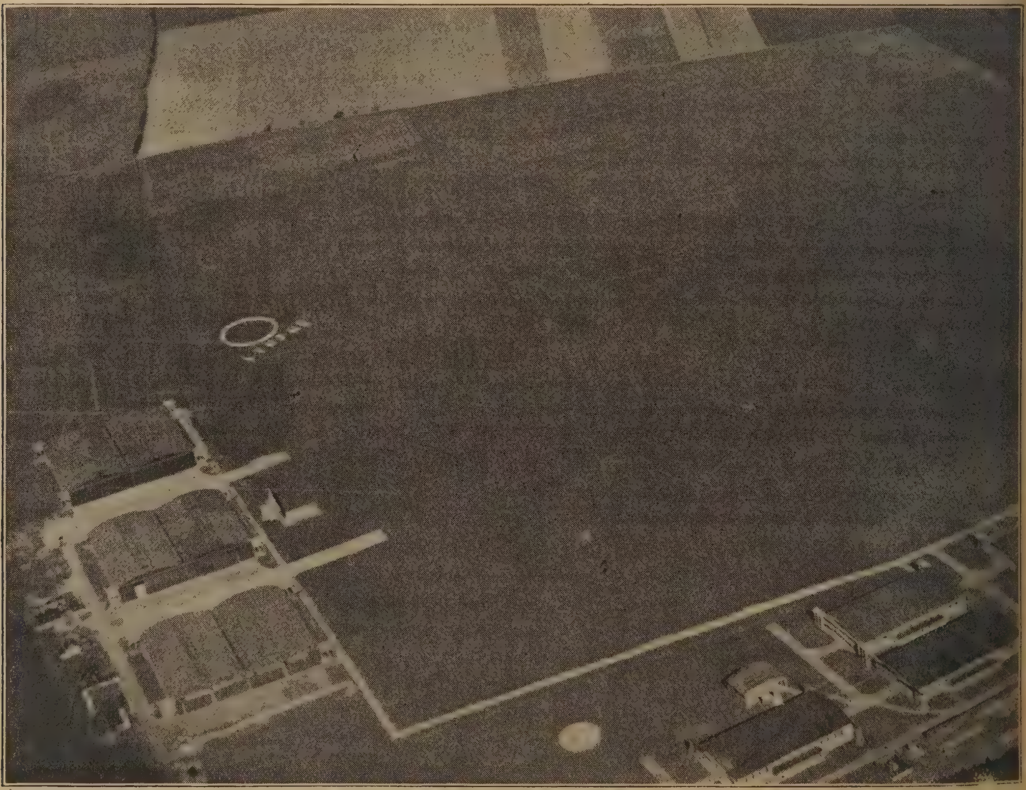
The competitors shall be teams of not more than three machines from each National Federation and the entrants of these machines shall be the constructors. Entrants and pilots must be of the same nationality as the National Federation which they represent.

With that small-mindedness which has been characteristic of the action of the Fédération Aéronatique Internationale ever since the outbreak of the War, as for example in refusing to recognise the German 24 hours' record made just before the War, countries that were at war with France are excluded from the race unless in the meantime they become members of the League of Nations—which they are precluded from becoming by the very nations who set up that absurd affair.

The first race for the Deutsch Cup will take place on Oct. 1st, 1921, over the course at Etampes which was used for the Gordon Bennett race last year. This would seem to indicate that the French Aero Club has about as little sense as the Royal Aero Club of Great Britain. Etampes is utterly un-get-at-able except by privileged persons with automobiles. It is thoroughly inconvenient in every way and even less fitted for a big international contest than is the Hendon Aerodrome. Obviously the proper place to hold this great international event is Le Bourgêt, which is quite close to Paris.

The Royal Aero Club kindly sends a mass of minor regulations concerning the Deutsch Cup with the request that they shall be published in this paper. All these regulations except those mentioned hereinbefore are only of interest to people who are thinking of entering racing machines for this contest, and if anybody is interested in them they can be had from the Secretary, the Royal Aero Club, 3, Clifford Street, W.1.

Unfortunately none of our aircraft firms at the moment can



**Lympne Continental Arrival and Departure Air Station photographed by Capt. C. H. Brewer with an Aero-Kodak, from a Handley Page "Air Liner."**

# SIR ROSS SMITH

**K.B.E., M.C., D.F.C., A.F.C.,**

the first to fly to Australia, says of the

# ROLLS-ROYCE AERO ENGINES

¶ "Undoubtedly we had **the best possible pair of engines,** and I offer my congratulations to Mr. Royce for designing those engines. They went through an extraordinary amount of bad weather, snow, rain and heat, and **never faltered once.** When we were speeding through deadly cold, nearly frozen and fed up, the only two happy things in the machine were those engines, **they purred along as if nothing mattered.**

"When we left Surabaya to start for Australia, we knew that ahead of us were 500 miles of open sea, and **the one thing that bucked me up was** that I happened to have this 'Vimy' with **two Rolls-Royce engines, which just two months before had flown across the wide sweep of the Atlantic,** and when I thought of what poor Alcock had gone through, our flight seemed only a joyride."

¶ "**The engines,** beyond the usual cleaning and adjusting, **had practically nothing done to them the whole time.** We would willingly, on reaching Port Darwin, have turned round and flown back."

¶ "We were so confident in the ability of the machine, that we simply went ahead in perfect confidence."

¶ "**A Rolls-Royce engine, properly looked after, would carry an aeroplane anywhere. The engines were the finest it was possible to have.**"

## THE WORLD'S BEST AERO ENGINES.

**ROLLS-ROYCE, Ltd., 15, Conduit Street, London, W.1**

**Telegrams: Rolhead, Reg, London.** **Telephone: Gerrard 1654 (3 lines).**

well afford to indulge in the luxury of building racing machines and therefore it would be waste of space, which is required for matters of public interest, to print the regulations in full in this paper. One would willingly do so if there were any chance of any sportsman being discovered in this country who would put up the money to build and run a racing aeroplane to compete with the new French projectiles.

It seems, however, that, despite all the high sounding names on the Council of the Royal Aero Club and on the list of Patrons and Stewards and the Committee of the Royal Aero Club, it is impossible to find one man who will spend as much on keeping a racing aeroplane for the honour and glory of British Aviation as is spent on the worst four-legged hair-trunk that ever figured among the also-rans in a Selling Plate on the Turf. It seems well to make this explanation lest the Royal Aero Club should think that any discourtesy is intended in one's refusal to publish in full the regulations for the Deutsch Cup Race.—C. G. G.

## SOME INTERESTING FIGURES.

Some interesting figures and facts are brought to light by a comparison between the Continental Air Traffic statistics of last week and those for the corresponding week of 1920.

Last week 65 aircraft conveyed 227 passengers on the Continental Air Routes, the crews operating these machines numbering 79, making a total personnel of 306.

In the corresponding week in 1920 84 aircraft carried 126 passengers, manned by crews of 96, making a total personnel of 222.

It will be seen therefore that this year 19 less machines were employed but 101 more passengers were carried

This year only 12 British machines crossed but they carried 112 passengers. In the same week last year there were 71 British machines carrying 113 passengers.

One is justified in assuming that had the present British air lines the financial nerve and enterprise of the late lamented A.T. and T., who this time last year were continually putting on ten machines per day on the services, the number of passengers carried by the British lines would be at least three times as large as they now are.—G. D.

## THE AERIAL DERBY.

It is hoped on the best authority that there will be at least two new Napier-engined machines in the Aerial Derby which is to take place on July 16th, the entries for which close on July 6th.

One also hears of one private entrant, a pilot known on the Continental air lines, who hopes to have a "Snipe" for the race. Mr. Muir, too, of the Surrey Flying Services, will in all probability be a starter if he can find a suitable machine.

It is more than probable that there will be a Bristol in the race, and at least one Martinsyde and possible the "Semi-quaver" in a modified form. Also there are rumours of certain Continental projectiles coming over for it as a preliminary canter for the Deutsch Cup Race in October.

One hopes that Mr. Olley or someone in K.L.M. will bring over the new racing Fokker.

The Royal Aero Club machines should certainly be entered for the handicap. On the whole it looks as though there may be a good race after all.—G. D.

## A "CHASER" FOR JAPAN.

One understands that a new single-seater fighting scout has recently been evolved by the Gloucestershire Aviation Company of Cheltenham. This is the "Sparrowhawk," and it is designed by Mr. H. P. Folland, who is, incidentally still designer to the Nieuport and General Aircraft Company, of which the moving spirit is Sir Samuel Waring, Bart., who obtained his baronetcy in connection with aviation.

The "Sparrowhawk" is not unlike the Nieuport "Nighthawk," but is fitted with a B.R.2 engine. One understands that 50 of these machines have been ordered by Japan. The first has recently been tested satisfactorily by Mr. J. H. James, and is shortly to be shipped to Japan by the LepAerial Travel Bureau.—G. D.

## NAVAL AND MILITARY AERONAUTICS.

### Order of Wearing Medals.

A list showing the order in which Orders, Decorations, and Medals should be worn was gazetted on April 22nd. It does not alter the existing order except that the Indian Distinguished Service medal is now placed immediately after the Edward Medal instead of immediately after the Air Force Medal.

### Belgian Awards.

The King has given unrestricted permission for the wearing of the following decorations conferred by the King of the Belgians on officers of the Royal Air Force in recognition of valuable services rendered in connection with the war :—

ORDER OF LEOPOLD.

COMMANDER.—Air Commodore Charles Laverock Lambe, C.B., C.M.G., D.S.O., R.A.F.

OFFICER.—Group Captain Cyril Louis Norton Newall, C.M.G., C.B.E., A.M., R.A.F.

ORDER OF THE CROWN.

COMMANDER.—Air Commodore Frederick Crosby Halahan, C.M.G., D.S.O., M.V.O., R.A.F.

OFFICER.—Wing Commander Lewis Leisler Greig, M.V.O., M.B., R.A.F.

CROIX DE GUERRE.

Air Commodore Frederick Crosby Halahan, C.M.G., D.S.O., M.V.O., R.A.F.; Group Captain Cyril Louis Norton Newall, C.M.G., C.B.E., A.M., R.A.F.

### The R.A.F. in Mesopotamia.

A dispatch dated Sept. 20th, 1920, has been received by the Secretary for Air from Lieut.-Gen. Sir J. A. L. Haldane, C.-in-C. Mesopotamian Expeditionary Force, submitting the following list of names of officers, warrant officers, non-commissioned officers, and men whose services are recommended as deserving of special mention :—

ROYAL AIR FORCE.—Bladon, Flying Officer G C., No. 30 Sqdn., R.A.F.; Mayoss, Flying Officer (Actg. Flt. Lt.) W. F., No. 6 Sqdn., R.A.F.; Thomas, Flt Lt. M., A.F.C., No. 30 Sqdn., R.A.F.; Cook, No. 155542 L.C.A. C. W., No. 30 Sqdn., R.A.F.; Cooling, No. 333099 L.A.C. G. F., Aircraft Park, R. A. F.; Croft, No. 313065 Flt. Sgt. G. C., Aircraft Park, R.A.F.; Jennings, No. 156440 A.C.2 B. J., No. 30 Sqdn., R.A.F.; Monk, No. 155943 A.C.2 D., No. 30 Sqdn., R.A.F.; Pengelly, No. 89309 A.C.1 W. A. L., No. 30 Sqdn., R.A.F.; Robinson, No. 83034 A.C.2 J., No. 30 Sqdn., R.A.F.; Tuckey, No. 2389 Flt. Sgt. J. H., No. 6 Sqdn., R.A.F.; Wilson, No. 201 Flt. Sgt. B. W., No. 6 Sqdn., R.A.F.

### Waziristan Awards.

The King has approved of the following rewards for gallantry and distinguished service in Waziristan, 1919-20 :—

Bar to the D.F.C.—Flying Officer J. R. Swanston, D.F.C., R.A.F. (since killed).

D.F.C.—Observer Officer (Hon. Flight Lieut.) D. Craik, R.A.F.; Pilot Officer N. Fielden, R.A.F.; Observer Officer B. A. Foord, M.C., R.A.F.; Flying Officer H. C. Hawkins, R.A.F.

M.B.E. (Military Division).—Pilot Officer B. W. Wright, R.A.F.

### GOLF.

### R.A.F. Officers' Meeting.

The Royal Air Force Golfing Association's meeting took place at Sandy Lodge on April 26th, 27th and 28th. There were 60 entries and 53 competitors took out cards.

In the team competition Uxbridge "A" team (Group-Capt. A. G. Hearson, Flt.-Lieut. C. H. Haywood and Flt.-Lieut. C. Lees) came first with a score of 252; 4th Supply Depot (Ruislip) "B" team being second with a total of 259 points.

The result of the four-ball foursomes against Bogey was :—(i) Flying Officer Cooke (11) and Sqn.-Leader Shorten (18), 7 up; (ii) Flt.-Lieut. Elliott (18) and Flt.-Lieut. Robertson (4), 4 up; (iii) Sqn.-Leader Hewat (6) and Flt.-Lieut. Barr-Sim (scratch) 3 up.

36 Holes Eclectic Competition. — First Division :—Flt.-Lieut. Lees (8), 2 up. Second Division :—Sqn.-Leader Shorten (15), 6 up.

Scratch Prize.—Sqn.-Leader Thompson, 78 The Handicap (First Division) was won by Flying Officer Fenwick, 85 less 10—75. Flying Officer Cooke (91 less 11—80) and Flt.-Lieut. Elliott (98 less 18—80) tied for second place, but Flt.-Lieut. Elliott was awarded the prize through having the best nine holes.

In the foursomes against Bogey, Sqn.-Leader Shorten (13) and Flying Officer Ingram (18) tied with Air Vice-Marshal Vyvyan (10) and Sqn.-Leader Thompson (scratch), but the first-named pair had the better return for the nine holes home and were awarded the prize.

### Another R.A.F. Defeat.

Although the R.M.C. (Sandhurst) only put their second strings into the field on April 27th they beat the R.A.F. (Cranwell) by eight events to one, F. E. Nuttall (Cranwell) winning the high jump with 5 ft. 6¾ in.

It is true that Cranwell has only about one-eighth of the number of cadets pertaining to Sandhurst and that therefore 8 to 1 is a fair proportion of wins, but the Flying Services used in war time to defeat superior military forces and the R.A.F. is expected to do the same in time of peace.

Therefore one suggests that what is lacking in numbers ought to be made up by intensive training. There seems to be room at Cranwell for an instructor who is also an athlete.

### British Aero Engine Supremacy.

Despite the many articles which have appeared in the lay Press depreciating the advance in Aircraft design made by British Firms, it is gratifying to know that the most efficient Aero Engine in the world, from all points of view—Economy, Reliability, and Speed—is the 450 h.p. Napier Aero Engine, known to the Air Service as the "Lion."

Although nominally rated at 450 h.p. it has developed as much as 530 h.p., and possibly its most wonderful achievement was when in the Air Ministry Competitions of 1920 the Aircraft which secured the Highest Prize in each class were fitted with these remarkable Napier engines.

X.Y.Z.

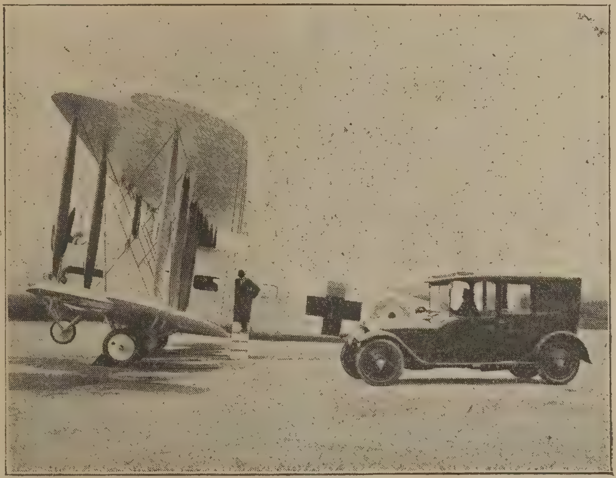
### London to Paris and Return—6 Hours.

One of the London-to-Paris Pilots left Waddon Aerodrome at 8.30 a.m., on 12th April, on a D.H. 18 machine fitted with a single 450 h.p. Napier Aero Engine. He carried 6 passengers and luggage to Paris, and arrived back with 8 passengers and luggage on the return journey at 2.30 p.m. the same day.

This Service is daily becoming more popular with business men and women, and while such journeys as that carried out by the Napier-engined D.H. 18 can be achieved so efficiently and quickly it will make the Service more popular than ever.

Any passenger desiring to complete the journey in particularly quick time should specify a seat on the D.H. 18.

N.T.R.



**NAPIER - VICKERS-VIMY AMBULANCE.** The photograph shows the new Vickers-Vimy Ambulance with two 450-h.p. Napier aero engines, recently supplied to the British Air Ministry, for service in Mesopotamia. The car in the foreground on the right is one of the famous 40/50-h.p. six-cylinder Napiers—the world's proved best car—built in the same factory as those very efficient 450-h.p. and 1,000-h.p. Napier Aero Engines.

### London to Paris Air Service—A Correction.

One noticed in an advertisement in a recent issue of this paper that an Aero engine firm claimed that all the machines used on the British London-to-Paris Air Service were fitted with their particular engine.

It is, of course, well known that the D.H 18 is the most economical and commercial machine at present in use, and is fitted with a 450 h.p. Napier Aero Engine.

One would like to know if there is any other Aero engine which could lift this machine when fully loaded as easily as the Napier. It is by reason of its light weight to power developed that the Napier is able to accomplish what no other engine in the world can do.

G.H.T.O.

### Napier Lion's Remarkable Range of Power.

It is not generally known that, although on the Government Type Test which the Napier "Lion" so successfully passed it developed a B.H.P. of 531, this engine is flown by the Pilots on the London-to-Paris Air Route at half throttle, the engine developing approximately 325 h.p. It will be seen, therefore, that this engine has a remarkable range of power, and can be flown at a relatively high speed whilst still retaining a large reserve of power for any eventuality which might arise.

B.E.S.T.

### Of Interest to Aeroplane Designers.

One understands that anyone interested in the installation of the 450 h.p. Napier Aero Engine will receive full particulars and catalogue or any information on applying to :—D. Napier & Son, Ltd., 14, New Burlington Street, London, W.1.

Representatives will always be sent to discuss the matter with anyone desiring particulars of this remarkable engine.

D.N.S.

**DE HAVILLAND**

**Aeroplanes = Avions = Vliegtuigen = Aeroplanos.**

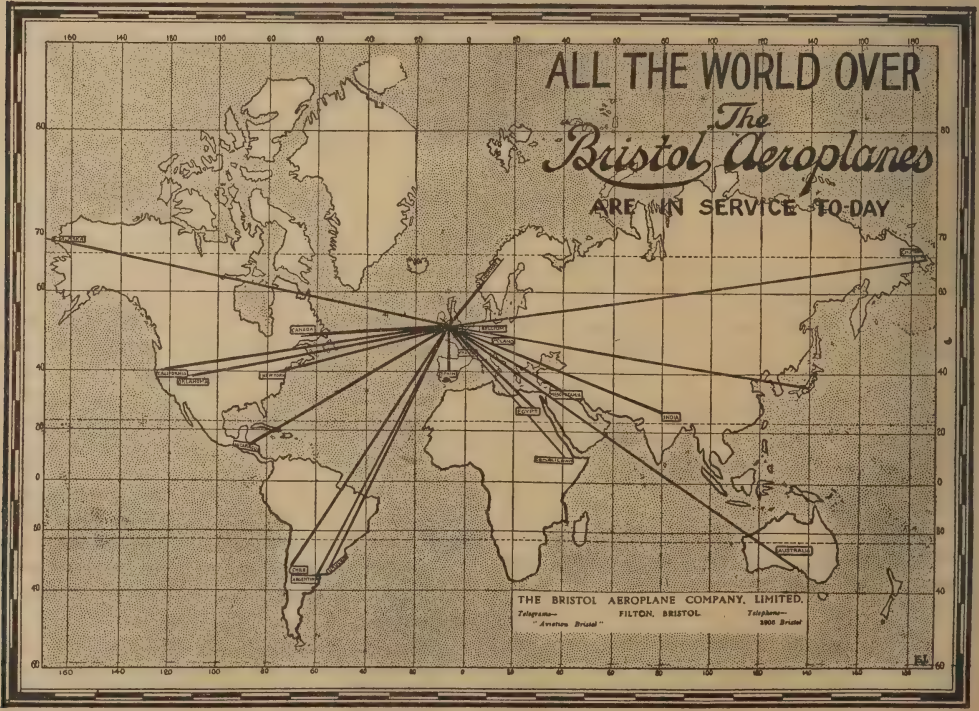
The De Havilland Aircraft Co., Ltd., is in a unique position to undertake the design construction and complete equipment of aircraft for every kind of commercial, scientific and administrative purpose. Enquiries are cordially invited.

Le De Havilland Aircraft Co., Ltd., se trouve placée dans une position unique pour entreprendre la construction, avec équipment complet, des avions de tous genres, destinés à des services commerciaux, scientifiques ou administratifs. Toutes demandes de renseignements seront accueillies avec le plus grand plaisir.

De De Havilland Aircraft Co., Ltd., bevindt zich in de gunstige positie, vliegtuigen te kunnen ontwerpen, te bouwen en uit te rusten, voor handeladoeleinden zoowel als voor wetenschappelijk of administratief gebruik. Aanvragen worden gaarne ingewacht.

El De Havilland Aircraft Co., Ltd. Esta compaña se halla en una situacioń sin igual para emprender el dibujo, constructioń y equipamiento de los máquinas de aviación de todos classes para los propositos comerciales, scientificos ó administrativos. Se ruega a todos que pidan informes.

**THE De HAVILLAND AIRCRAFT CO., LTD.,**
**Stag Lane Aerodrome, Edgware, Middlesex, ENGLAND.**



# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

A book dealing with the history of Aeronautics from the earliest times to the present day has just been published.

The history of Aeronautics is a story of fascinating interest, and it is one which should be known to all those who are interested in any way in aviation to-day. A very lengthy review of this book is therefore given below, and it is hoped that it may arouse the interest of at least some readers and cause them to study the history of man's early attempts at flight.

The results of certain tests made in America with a view to adding to the existing knowledge of the loads imposed on an aeroplane in flight are recorded briefly on page 444. Investigations of this type are of the utmost importance, for from such experiments alone is it possible to discover how strong an aeroplane must be built to be really safe under flying conditions.

Those readers of this paper who believe that the staff of a journal such as The Aeroplane lead carefree and joyous lives are invited to read the "Hints on being a Technical Editor" which appear on page 442.

## THE HISTORY OF AERONAUTICS.

The history of aeronautics is still being made, wherefore it is eminently desirable that those who are engaged in the making thereof should have some fairly clear idea of what has been done by their predecessors. It is, however, the unfortunate fact that very many of those who must be regarded as among the leaders of aeronautical progress to-day are most profoundly ignorant not only of the really early history of aviation, but even of those parts of that history which are comprised within the last twenty or thirty years.

There is very little doubt that the suggestion now made, that there is any history of aeronautics dating back further than twenty years will come as a shock to some readers of this journal.

Yet in July, 1894, the experimental development of aeronautics had proceeded so far that Mr. (later Sir) Hiram Maxim's 360-h.p. aeroplane, running under its own power, had developed a lift not merely equal to the 8,000 lb. of the machine's own weight, but sufficient to carry away the set of rails intended to confine it to a rise of a few inches, and to cause it to make an involuntary free flight of some appreciable extent.

Incidentally, the present writer as a schoolboy happened to read in the *Century Magazine* of about two years later Maxim's own account of these experiments, and this sufficed to implant in him a confidence in the possibilities of the aeroplane as a means of aerial locomotion which has persisted to this day.

Long before this men had aspired to flight, and had conjectured upon and experimented with the possibilities of achieving their aspirations.

Therefore the book which has just been published by W. Collins, Sons and Co., entitled "A History of Aeronautics," by E. Charles Vivian, with a section on Progress in Aeroplane Design by Lt.-Col. W. Lockwood Marsh, O.B.E., is to be welcomed.

### The Difficulties of Selection.

In a foreword the author points out the difficulty of the task which has been attempted, in that the mass of experimentation and speculation upon this subject is so vast that a one-volumed history can do no more than select, and that the sources from which the data are to be collected are so scattered that omissions can scarcely be avoided.

Despite these facts the book is of great interest. It is impossible not to feel that in places the selection could have been improved, that certain matters would have stood further elaboration, that others need not have been discussed at quite such length, but equally another critic could justly have made the same general remarks upon one's own selection.

The book opens with a chapter on the period of legend, and very justly the author points out that the prevalence of legend proves definitely that man has from time immemorial aspired to dominion over the air. Further one may concede his claim that the legends of antiquity have probably some basis of fact, that although Icarus never flew, yet probably Icarus at least crashed in attempting to fly. Be that as it may, the author has collected a series of legends some of which at least are likely to be new to most readers.

### Lifelike Legends.

Some of the later of these legends almost certainly have a basis of fact. Those of Simon the Magician, of the Saracen of Constantinople in the eleventh century, and of the Monk Oliver of Malmesbury (A.D. 1065), almost certainly relate to the tragic results of experiments in the art of gliding.

After these legends for some centuries only fairy tales of the flight of wizards and witches appear until a work by C. Crispolti, of Perugia, published in 1648, records the successful gliding experiments of one Giovanni Baptisti Danti, who at the close of the fifteenth century flew across the great Piazza of Perugia, whereafter the mainstay of the left wing gave way and he fell on a roof and was injured. The said Danti was evidently a man possessed of the modern spirit of experimentation, for it is recorded that before this disastrous flight "he several times flew over the waters of Lake Thrasimene, to learn how he might gradually come to earth. But notwithstanding his great genius he never succeeded."

It may have been some consolation to his departed spirit to note how many of his successors have fallen into the error of believing that water offered a safer alighting ground than did the earth.

After Danti the history of aviation departs from the realm of legend and enters that of fact.

### The Beginnings of History.

The work of Leonardi da Vinci is mentioned at some length, illustrated with extracts from his works, and show that this genius of the fifteenth century had a more clear understanding of the principles of aeroplane equilibrium than have certain modern writers on the subject.

Da Vinci's statement that "a bird is an instrument working according to mathematical law" has even yet not been adequately digested by certain "authorities" on aviation.

It is curious to observe how many of the earliest pioneers of aviation were artists. Da Vinci was amongst many other things an artist, and as an artist he is chiefly known. Paolo Guidotti, who in the middle of the sixteenth century made for himself wings, and appears to have glided successfully therewith, was a painter, and after crashing and breaking a thigh returned to his painting. Following came a Venetian architect, one Veranzio, who appears successfully to have experimented with parachutes in 1617-18.

Of these and many another who concerned themselves with experiment or speculation, rational or ridiculous, as to the possibility of artificial flight before the nineteenth century, the book gives an interesting record in its first two chapters.

### Relatively Modern Times.

With the third chapter one enters upon what may be regarded as the modern history of aeronautics. It was not till the 19th century that the steam engine came into practical existence, and thus opened up the possibilities of using some power other than that of the human muscles for the purpose of aerial propulsion. And it is of great interest to observe that until quite late in that century the advance of aeronautical knowledge, apart from experiments with balloons, was almost entirely due to English enthusiasts.

### The First British Pioneers.

Sir George Cayley was the first of these British enthusiasts. He clearly saw the necessity of applying motor power to flying machines and pointed out that flight by muscular power, if not impossible, could only be regarded as a "stunt." He measured the forces acting on inclined planes, discovered the virtues of cambered surfaces, and built a stable glider, which, however, does not appear to have ever carried a man. Following Cayley came other Britishers—W. H. Phillips, who built a model steam helicopter of two lbs. weight which lifted; W. S. Henson, who built model gliders, and light steam engines and evolved and patented a steam-driven monoplane in 1840, which shows all the essential features of the modern aeroplanes. Henson's early experiments were carried out in conjunction with Stringfellow, who later, in 1848, built a steam model which actually flew.

Thereafter "having now demonstrated the practicability of making a steam engine fly and finding nothing but pecuniary loss and little honour," Stringfellow made no further experiments till after the formation of the Aeronautical Society of Great Britain in 1866. His experience in regard to both cash and credit is by no means unique.

All these facts and many others equally interesting are recounted, and to attempt further to outline the contents of the book would take more space than can here be spared.

Nevertheless, this outline of the early history of aeronautics should serve to show how very little separated these early efforts at mechanical flight from success, how little different were the trials and tribulations of early pioneers from their later and slightly more successful descendants.

After Stringfellow the story rolls on through the latter half of the 19th century passing the work of Penaud, who laid down the specification for the modern aeroplane as it exists to-day in a patent of 1876; Thos. Moy, Horatio Phillips, Lilienthal, Langley, whose work has been briefly recorded in this journal within the last few months; Clement Ader, and so to the Wright Brothers.

### The Period of Achievement.

Thereafter naturally the history becomes sketchy, for history was made at a prodigious rate during the years from 1908 to 1911. A full record of the work of these years would require many volumes; an outline must of necessity omit many facts both important and interesting.

Yet on the whole the sketch is fairly well done If one might venture to criticise at all it is that on the whole attention is confined mainly to the great flying meetings and to the spectacular flights of that period, and little insight is given into the everyday work of the early pioneers.

Yet it must be acknowledged that only an inspired writer could do justice to this latter subject. Had Rudyard Kipling but lived at Brooklands for six months in 1910 or '11 the world might have hoped to gain an understanding of the true history of those days—and a record of facts and of flights achieved can never give that understanding.

For after all it was the men who did the work, and the spirit wherein they did it, that made history—not merely the flights they achieved. This fact the author himself recognises, when he points out that in the early days one spoke of the men, Farman, Blériot, Paulhan or Curtiss, whereas now one speaks of the machine. From which he concludes that the age of giants has passed. Yet many of the actual giants of those days remain alive—is it that success has swollen their purses and shrivelled their souls?

One hopes not, for there are yet worlds left for aviation to conquer.

### The War Period.

The history of aviation in the war period occupies but two short chapters. The accuracy of these chapters is by no means beyond question in matters of detail. For instance, in dealing with the early Fokker monoplane scourge, no mention is made of the fact that the Fokker owed its effectiveness to the synchronised machine-gun, but it is suggested that its deadliness was due to its superior performance. Further it is stated that the day of the Fokker ended when the B.E.2c came to France in good quantities. It was in fact the B.E.2c which was known as "Fokker Fodder."

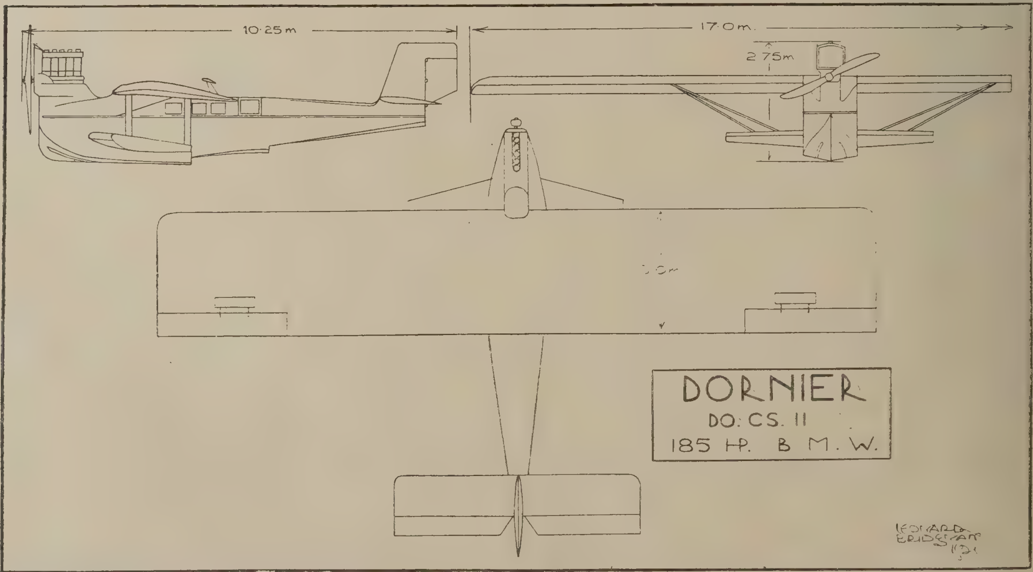
Also the statement that "It was a seaplane that gave Admiral Beatty the news that the whole German Fleet was out before the Jutland battle, news which led to a change of plans which very nearly brought about the destruction of Germany's naval power," requires substantiating. The *Campania*, from which Flight-Commander Rutland made his flight, was well behind the battle cruisers, and one has always understood that lack of visibility on this occasion prevented the gathering of any vital information.

The history of after the war is dismissed in equally short measure. These two latter periods, however, are not yet ripe for historical treatment, and any sketchiness in their treatment detracts little from the value of the book, for the facts of these two periods are easily accessible to anyone possessing curiosity and a little patience.

### Technical Progress.

Col. Lockwood Marsh's section, "The Progress of Design," deals only with recent history, 1903 to 1920. Here again the dictates of space render impossible anything but an outline of the subject. Generally speaking, this outline is accurate, though there are a few misprints and mis-statements, i.e., a Farman biplane is said to have been loaded 31 lb. per sq. ft., where 31 lb. per h.p. is intended, and the Fokker firm is credited with having built monoplanes with metal cantilever wings, whereas in fact the Fokker machines were, it is believed, all wooden winged.

So far the book deals with heavier-than-air craft, but there follows thereafter a section on aerostatics and one on engines.



Scale drawing of the Dornier Tractor Flying-boat described in this journal for April 20th. This should be compared with the drawing of the earlier and larger twin-engined boat from which it derives, printed on page 442.

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AEROPLANES

It is not very clear who is responsible for these two sections, but that on aerostatics at least seems to be due to Mr. Vivian.

For some reason the history of aerostatics lacks the romance of the history of heavier-than-air machines, but it can scarcely be left out of such an account as this. With the advent of the powered airship it becomes more interesting and assumes a degree of high importance. So far as one is competent to judge the history given is very fairly accurate.

This section is followed by one on engine development. This is arranged in sections dealing with types, starting with the vertical (under which head curiously enough Maxim's steam engine is described), passing on to the Vee type, and then to the radial. This division is somewhat unhappy for historical purposes, for, after all, the cylinder arrangement is solely a matter of detail design and the types have not developed in set order. For instance, the first practicable petrol aero engine, the Langley-Manley, was a radial, and the second, the Wright, was a vertical, yet with this arrangement the Manley engine is not described till after the Napier Lion—a somewhat curious result in an historical work.

### A Sketchy Engine Section.

If the description of the history of aeronautics is sketchy, even more so is that of aero-engines. It is, of course, not to be expected that a complete description of every engine of historical note should be given, but even such as are described are described sketchily, and very little indication is given of the methods which have led to the enormous decrease in the weight power ratio during the last five years.

In the section on Vee engines neither the Antoinette or the E.N.V., the first Vee type engines to fly with any success, are even mentioned. Also the Rolls-Royce "Hawk"—a six-cylinder vertical—is said to be a Vee. Except for a casual mention of the Renault, the 1914 De Dion, a Panhard, and the American Curtiss and Kemp types, English engines alone of this type are recorded. The Hispano-Suiza could not be suspected from this record.

Under Radial Engines the 1901 Langley-Manley is given ample credit, and the Anzanis and the Salmson are mentioned at some length.

The two-cylinder opposed type is also given its chapter, entirely devoted to antique engines of ancient date. This is probably the most nearly complete part of the engine section, and deals almost entirely with engines of some historic interest.

Some attention is given to the two-stroke cycle, and by some curious error a section of the Ricardo "Dolphin" type two-stroke is described as "Dugald Clerk's two-stroke cycle engine." The engine is on Dugald Clerk's cycle, but it is not his engine.

Under "Engines of the War Period" the standard German vertical types are dealt with at some length. Otherwise only the British A.B.C. and "Cosmos" engines are described. The "Jupiter" is so described as to give the impression that it is fitted as a standard with a reduction gear, and that the sample fitted in the original Bristol "Badger" was of this type. As a matter of fact it is not yet recorded that any geared Jupiter has taken the air. Also it is stated that this engine is no longer being made, whereas in fact it is now made by the Bristol Aeroplane Co. Ltd.

The book contains a number of extremely interesting reproductions of photographs and prints of very early aircraft, but the photographs of more modern date are rather disappointing, and in places incorrectly or inadequately described. A picture of a B.E.2e—by no means a notable machine—is labelled "R.A.F. aeroplane," and a flight of S.E.5s is labelled "Bristol Fighters in formation."

Despite these many inaccuracies and omissions of detail the book remains a valuable and an interesting record.

It deserves to be read by all interested in aeronautics, but it should be regarded with some slight suspicion as a statement of facts.

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*"A History of Aeronautics." By E. C. Vivian and Lieut.-Col. W. Lockwood Marsh. London: W. Collins, Sons and Co. Ltd. 30s. net.

## LOOKING AND LANDING.

The following letter has been received from C. G. Sturt, A.F.C., A.C.G.I., B.Sc., A.F.R.Ae.S., Captain, late Wing Flying Examining Officer 35th Wing, R.A.F.:—

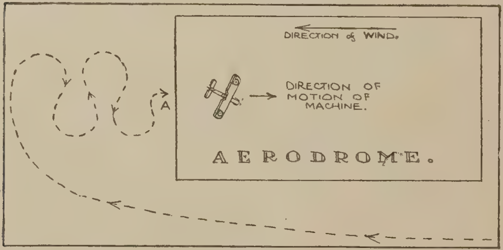
Sir,—As a constant reader of your paper your article re landings interested me. As you say, such a topic is bound to create comment, and doubtless you will have received many letters of agreement or *vice versa.*

I have spent some 1,000 hours on instructional flying both as regards the training of pupils and the training of instructors to instruct.

It has therefore been necessary for me in the part to analyse as much as possible the actual feelings of and movements made by the pilot during the process of landing.

Perhaps to start with it would be well to give the actual instructions which were given to the embryo pilot before attempting to land.

He was first of all told to choose his landing ground and then decide on a spot on to which he intended to pull up. Next he was to proceed to the leeward side of the aerodrome to a distance of roughly half the aerodrome's total length. The engine was then shut off and the glide down begun in gentle straights and S turns as shown in the sketch.



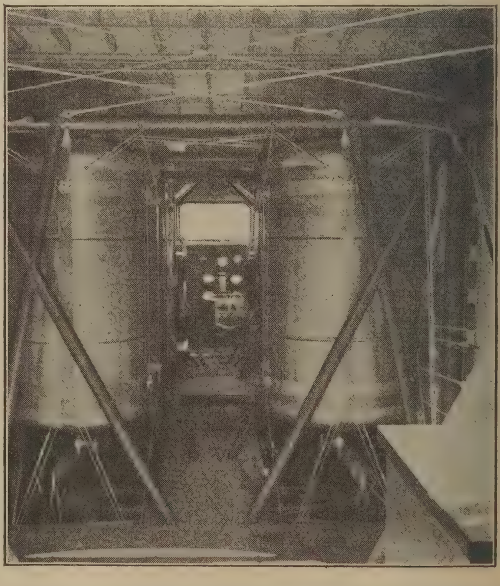
The last turn at A was timed to be such that at this stage the machine was some 500 feet from the ground. No more S turns were made after this, but the pilot was told to bring the machine to such a position at this stage that if anything he would overshoot the mark to be landed on.

The machine was then gently slewed round with the rudder and just sufficient opposite bank applied to cause it to lose height rapidly in a flat sideslip. The pilot was instructed to look diagonally over the side of the machine at the mark on the ground on which he desired to land.

It will be noted from the sketch that the machine is slewed round to such an extent that the resultant direction of the sideslip and forward components is dead into the wind. This is very essential as otherwise when the rudder is kicked back to bring the machine trim for landing considerable drift would either wipe off the undercarriage or at any rate badly strain it.

As regards the so-called "feel" of the machine, I am afraid I am not a very great believer in it. Many pilots have come to me and said that they fly by feel entirely. After careful analysis of my own feelings when flying I am convinced that sight and brain are the principal factors. Put the pilot who says he flies by feel in a machine, take him up a fair height and then put his head in a bag and tell him to fly the machine. In about 30 seconds he will be lost.

I have sometimes been surprised at the extraordinary ignorance and inaccuracy of the average flying officer who has not been trained to analyse his feelings in this way. For myself, I admit that after some experience on one type of machine I fly a little by feel, but I am sure quite 90 per cent.—the remainder—is by eyesight and brain. (Sgd.) E. G. Sturt.



A view in the fuselage of Zeppelin 4-engined giant biplane. The petrol tanks are reminiscent of airship practice.

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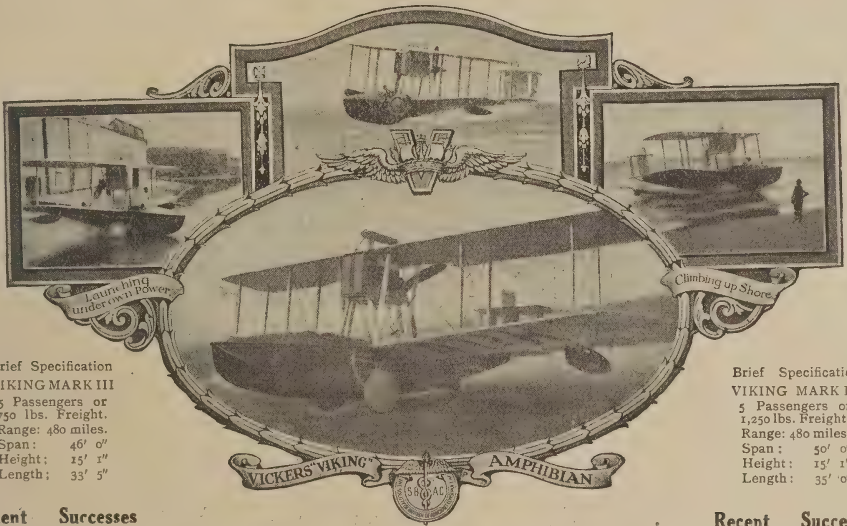

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## HINTS ON BEING A TECHNICAL EDITOR.

By One Who Has Tried It.

Those fortunate people who merely read aeronautical journals can have little conception of the trials and tribulations of those whose hard fate it is to have to write the contents of the said journals. Some of the fortunate ones may at times and when, have honoured the editorial offices of their favourite weekly with a visit. They will have encountered—if they have arrived sufficiently after lunch—a large, burly and jovial being who, they are given to understand, is "THE" Editor.

They may—if the object of their visit is the satiating of an insatiable curiosity—have been referred to the technical department, but in either case they will have gained the impression that the editorial offices are a temple devoted entirely to talk and tea, and that the more talk the better so far as the whole staff is concerned.

And they depart enviously—all hoping in their hearts that they themselves may one day retire and lead a literary life.

Well good luck to them—but let them beware. If they are determined to be editors let them take care that they are real editors, and not qualified or adjectived editors. There is one certain way of avoiding the latter fate entirely—of missing out this step on the path to fame and becoming at one fell swoop "THE" editor.

All that is necessary is to found a journal for oneself. This amongst other advantages has that of providing a sure escape from the necessity of paying super-tax.

If any readers of this screed are afflicted by a passion for editorship and find the foundation of a private paper unpracticable, let them stifle their passion. If that is in its turn impossible, then beware of becoming a technical editor. Any other type of subsidiary editorship may be bearable—but if you are to become a technical editor you must resign yourself to a life entirely devoted to the commission of impossibilities.

It not that there is any real difficulty about technical editing. That in itself is fairly simple. The difficulty arises from the fact that everything you edit technically will thereafter be re-edited untechnically. Editors—the unqualified type—always possess the most autocratic powers in regard to terminology.

If the editor says that you are never to use the word propeller when you mean an airscrew, well, you must sink your personal feelings and do as you are told. You will find inevitably at some time that you really meant propeller when you thought you meant airscrew. At least "THE" editor will tell you so, which is, in practice, the same thing.

You must never use a word which frightens him—and it's surprising how timid editors are where words are concerned. Mine is simply terrified of most of the words I like best. For instance, I am instructed to write an essay on the qualities of certain aerofoils, but on no account am I to use the phrase "lift coefficient" therein. Of course, I need not use it. I might re-christen this quantity "Liftiness"—and he would probably never realise that it meant the same thing—but then, what about the Technical Terms' Committee?. After all he's only part of them, and the wrath of the whole exceeds the wrath of any part thereof—as Euclid so clearly puts it.

Then his fear at the sight of a symbol like $V^2$ is inexpressible, and as for little d's they cause him to go mad and bite. Of course, if you are not on the staff these things don't matter.

If you write the "square of the speed" instead of $V^2$ he's relatively quiet, and one may speak of the "rate of change of" whatever it is instead of the little d, and he will probably not realise that he's paying you for so many more words than are really necessary. But if you happen to be technical editor you don't get paid extra for more words, and you do get cussed because there isn't room in the technical section for the overmatter from other parts of the paper.

It's a hard life—but if anyone with a nice quiet and well-remunerated job would like to try it for a bit, any proposal for an exchange of billets would be carefully considered.

W. H. S.

[That is the worst of combining a malarial liver with a mathematical brain.—C. G. G.]

## CURIOSEST.

In the more noisy of the penny dailies a certain gentleman who signs himself H.H. has been writing lately on aviation. He has been writing much stuff of a sensational nature, and as I probably know more about aviation than Mr. Henery Hawkins, as I presume his name is, why should not I turn a more or less honest copper in like fashion? I am therefore giving you a few details of a racing machine of which I am aware.

This machine has a 7,000-h.p. Damlier engine

It is fitted with the new Huntly-Palmer perforated wing and has variable camber, retractable undercarriage and adjustable pilot.

Its speed is perfectly tremendous, and it is likely that during the Aerial Derby people watching it will not be able to see it. (This is one up on Mr. Henery Hawkins' bus, where the speed causes the wings only to vanish.

During a test from Glasgow to London recently the machine was intended to land at Hendon, but although the engine was switched off over Manchester the machine fell into the sea off Brighton. It is thought, therefore, that the machine will be difficult to land.

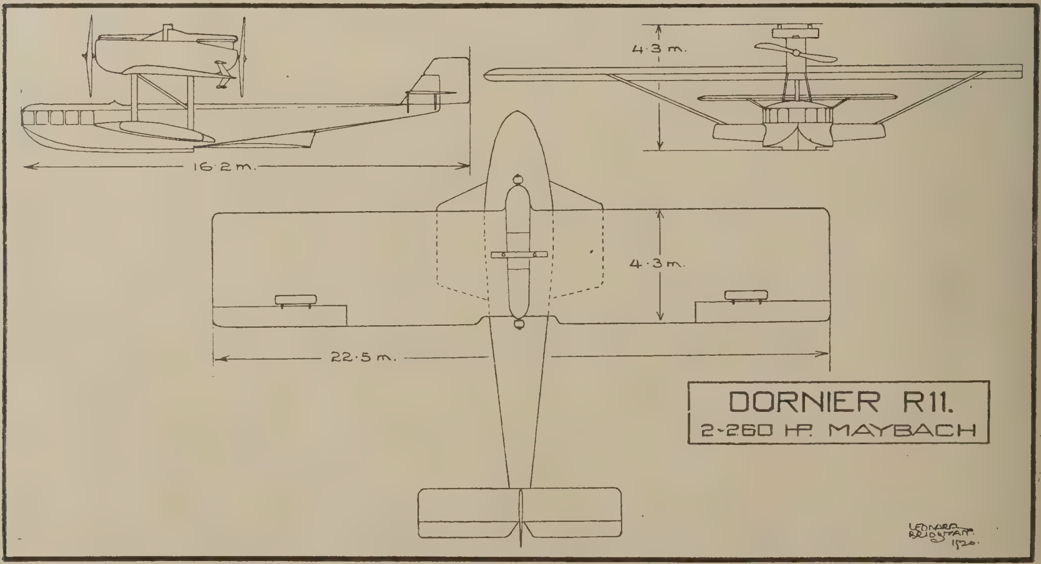
During the actual race the noise of the engine is not expected to arrive until twenty minutes after the machine has landed.

So great is the quantity of air taken down the air-intakes of the great engine that the towns over which the machine passes are left with only one day's supply of atmosphere.

As the engine is 100 per cent. efficient there is no exhaust.

The lift coefficient of the wing worked out to a recurring decimal, and as the decimal is still recurring it is not possible to give the total lift.

The pilot of the machine is studying Christian Science. He expects this to help him with the landings.—W. W.



The Dornier two-engined monoplane boat. Compare with the later and smaller single-engine tractor shown on page 438.

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## THE INVESTIGATION OF STUNTS.

It is probably now fairly well known that a large number of experiments have been made in this country, particularly at the R.A.E., in order to determine the loads imposed on an aeroplane when it is manœuvred. These experiments have mostly been made by the use of an accelerometer—which in effect is an instrument which measures the excess heaviness of the machine which carries it caused by accelerations, and therefore the excess load which is carried by the wings during the manœuvres which cause those accelerations.

It is perfectly obvious that if a designer knows accurately the maximum load which can be imposed on his wing-structure by any given manœuvre, he has at once a valuable guide as to the strength which he must provide in the structure of the aeroplane to resist that load.

Report No. 99 of the American Advisory Committee for Aeronautics shows that the British experiments with accelerometers have been repeated and extended in America, with results which generally confirm those already obtained in this country.

These tests have been carried out with a somewhat more elaborate and, it is hoped, more accurate instrument than that used at Farnborough, and so far as one may judge from the available accounts of British tests, the Americans have tested manœuvres of a more violent kind than their British forerunners.

The machines used on these tests were Curtiss J.N.4D., DeH.4B. (Liberty-engined D.H.4) and Bristol Fighter. The tests cover bad landings, loops, spins, rolls, pulling violently up from glides at various speeds, and going into dives suddenly from level flight.

The maximum acceleration recorded in these tests occurred in a bad landing, when a J.N. was allowed to glide into the ground with practically no flattening out. This gave a maximum acceleration of 5.25 times gravity on the first bounce. This does not in the least mean that the wings are loaded to 5.25 times normal loading, as the machine was not airborne at the time. It does indicate, however, that a pilot can survive an acceleration of this magnitude for a short time without collapsing

A bad pancake landing gave an acceleration just under 5, and a curious fact disclosed by the record is that the loading imposed by rolling over the ground may exceed that of the actual landing, reaching apparently something like 3 on reasonably good ground. A "three point" landing on the J.N. gave an acceleration of 2.2 G, but the bumps due to the ground after landing considerably exceed this figure.

A bad take off, with a bounce before finally leaving earth gave an acceleration of 3.78 G—or considerably bigger than that due to a good landing.

A bad loop, with a quick pull up, stalling at top and falling out sideways gave a maximum acceleration of 3.21 G. This represents 3.21 times normal load on the wings.

A better loop, starting at a higher speed, but still hanging at the top, gave practically the same maximum, but in this case the maximum load occurs at pulling out of the dive instead of a pulling up into the loop.

A smooth loop starting at a still higher speed, gave a maximum load of three times normal, and a still faster smooth loop one of 3.68.

Rolling on the J.N. gave accelerations up to 4.20, the highest load experienced in any manœuvre. Pushing the stick forward as rapidly as possible on a J.N. gave a negative acceleration of 0.539—i.e., a top pressure a little over half the normal loading.

A sharp spiral on the J.N. gave a maximum loading of 3.06 times, normal spins on the DeH.4, the Bristol and the J.N. gave loads 2.78, 2.72, and 2.57 times normal respectively. With the J.N., however, 2.7 and 3.12 times normal load were found pulling out of spins. On a vertical bank on the D.H.4 the maximum load is 2.42 times normal.

Tests in pulling back as suddenly as possible were made on DeH.4 and J.Ns., from speeds of 50, 60, 70, and 80 m.p.h. The maximum acceleration of the J.N. from 80 m.p.h. was 3.52, and on the DeH.4 somewhat less. These results agree fairly closely with those computed on the assumption that the machine is pulled back so as to present the angle of maximum lift at the initial speed.

The conclusion arrived at is that a true factor of 4.5 on the wing structure of an aeroplane is sufficient for all manœuvres likely to occur, except a deliberate effort to break the machine. It is also suggested that a recording accelerometer should be used to examine pilots, as the record will show at once if he be heavy handed.

Report No. 105 of the American Advisory Committee for Aeronautics also gives the result of research carried out by Messrs. E. P. Warner and F. H. Norton on aircraft during manœuvres.

The methods adopted were those of measuring the actual angle of incidence and the corresponding air speed by a vane incidence meter, and a flat plate air-speed indicator carried in front of the wings and photographed at close intervals during the manœuvre by a gun camera.

From the record of air speed and incidence it is possible to deduce the loading and the distribution of that loading at any instant from the known qualities of the aerofoil section. By using two sets of instruments, one on each side of the machine, the difference in air speed and in angle of attack along the wings during a manœuvre such as a spin can be computed.

Among the results obtained the most surprising is the very great angle of incidence reached in a slow loop—very considerably greater than the angle of maximum lift of the wings, a condition which differs widely from the results of British calculations as to the conditions holding during a loop.

The experiments on spins produce some interesting results. They show that there is a very uneven distribution of load along the wing, and the fact that probably the lower wing carries an abnormal proportion of the total load. The maximum stress produced is not very large. They also indicate that wings with a washout towards the tip will be less liable to spin, and will spin more slowly and will recover more easily than will a parallel wing.

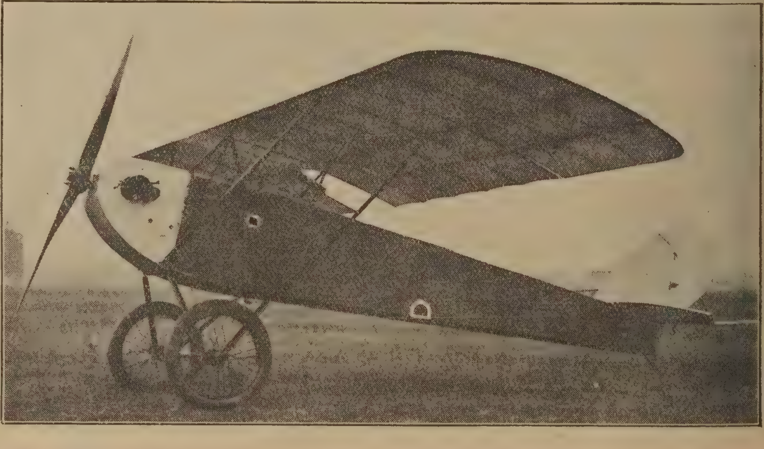
## GERMAN WIND TUNNEL TESTS.

There has just been issued by the Verlag von R. Oldenbourg of München and Berlin a report of the results of experimental work carried out at the Göttingen Laboratory.

This report includes a very complete description of the wind tunnel equipment used, some account of the theory of the behaviour of aerofoils which has been developed by the scientists engaged at that laboratory, together with accounts of experimental verifications of that theory, and the results of a large number of tests on aerofoils of varying sections.

Those whose acquaintance with the German language is sufficient to attack the book will undoubtedly find in it much interesting information on the subjects with which it deals.

(Ergebnisse der Aerodynamischen Versuchsanstalt zu Göttingen. Edited by Dr. L. Prandtl. R. Oldenbourg, München and Berlin. Price 40 marks.)



**A GERMAN SPORTING MONOPLANE.—A photograph of the Rieseler sporting single-seater, fitted with a 2-cylinder Haacke 30-h.p. air-cooled engine. Foreign designers seem to have a fair amount of faith in the future of the small cheap sporting type, despite C. G. G.'s frequent demonstrations of their error. Perhaps the predatory instincts are better suppressed among German females.**

**This particular variety of the type is alleged to be extremely pleasant to fly and cheap to build.**

A History of Aeronautics

BY

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## HELICOPTERS AND PARACHUTES.

The following letter has been received :—

Sir,—I have read with great interest the description of the Petroczy helicopter, published in your issue of the 27th inst., and notice that in the account of the fifteenth test flight the writer states that "the crew were frightened into leaving by parachute." I have had some personal experience of parachuting both from aeroplane and kite balloon, and have also made numerous tests, with dummy loads, from six different types of aeroplanes and from kite balloons or airships, and with many different kinds of parachutes, and I can only say that unless the oscillations of the helicopter were so severe as to tilt the cockpit parallel with the ground, the feat of jumping clear of the 20-ft. airscrews—not to mention the landing framework—appears little short of marvellous.

Also as the machine was at a height of not more than 120 ft., the crew were indeed fortunate, in that their faithful parachutes opened in time to save their lives. I believe the lowest recorded height from which a successful descent (from a stationary object) had previously been made was 153 ft., when Major T. Orde-Lees, R.A.F., leapt from the Tower Bridge with a "Guardian Angel" parachute in 1917, and in that instance the parachutist had very few feet to spare.

(Signed) OSCAR B. PATON,
Late P/O R.A.F., Parachute Section.

April 30th, 1921.

[As a matter of fact the statement that the crew left by parachute is possibly inaccurate. The report of the trials does not definitely state that the crew left in this way, but the context seems to infer that that was their method of exit.

For the rest, it appears that the machine was fitted with mechanically ejected and opened parachutes which, in a wind of 8 metres a second (18 m.p.h.) might easily carry them clear of the airscrews, particularly if they left at one end of a swing to leeward. Secondly, there are no grounds for believing that the height of leaving did not exceed 120 feet.

This figure was only mentioned as the minimum estimate that was compatible with the appearance of the photograph reproduced. It seems probable that the height was round about 50 metres—a height which seems to have been the standard for test flights—and 50 metres is 164 ft., or somewhat more than Major Orde-Lees' minimum.—Ed.]

* * *

## TRADE NOTES.

### An Important Trade Change.

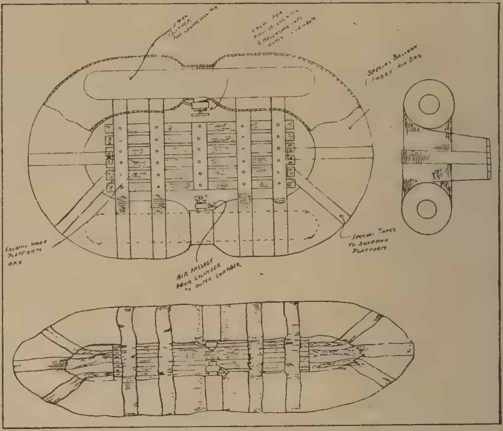
Rolls-Royce Limited have secured the services of Mr. A. J. Rowledge for a long term of years.

Mr. Rowledge was chief designer for many years for the Wolseley Motor Company, and during the past seven years has been chief designer for the Napier Company. His name is well known as an eminent designer, especially in connection with aero engines.

### A Life-Saving Raft for Aircraft.

The diagram here reproduced shows a form of collapsible raft designed for use on aircraft operating over sea. The arrangement consists of a pair of balloon fabric floats, semi-circular in plan, from which a wooden grating is suspended by a series of tapes. The grating is surrounded by the floats, and drops in use to some two feet below the level of the floats themselves. These floats are inflated by two steel cylinders of compressed air, which form part of the apparatus, on giving a half turn to the air valves of the cylinders.

When deflated, the air bags and the platform stow in a very narrow space. When inflated the float is 7 ft. long by 4 ft. wide, and has ample capacity to carry four persons. The total weight is 56 lb. It takes only 30 seconds to inflate, and the cylinder can be refilled from either an air compressor, or from a standard 100 cu. ft. oxygen bottle.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FOLDING WOOD PLATFORM OAK
AIR PASSAGE FROM CYLINDER TO OUTER CHAMBER
SPECIAL TAPES TO SUSPEND PLATFORM

There should be no serious difficulty in finding stowage room for such floats on modern passenger aircraft, and the arrangement appears to offer considerable advantages as compared to the ordinary type of individual life belt.

The device is patented and manufactured by W. J. Austin and Co., Metropolitan Bank Buildings, Swansea.

### Up-to-Date Ideas.

It is natural that in view of the absurd prices now charged for everything connected with printing that some enterprising individual should devise a means of decreasing the price of some of the accessories of newspaper production. The first step in this direction seems to have been made by Brock Brothers and Atkinson Ltd., 48, Russell Square, London, W.C.1, who are now supplying printing blocks, either line, half-tone or colour, made in Belgium at a price approximately 33 1-3 per cent. less than that charged by British blockmakers.

As a further evidence of the up-to-date ideas of that firm, they note on their price list that urgent blocks will be sent from Belgium by air, in which way they will save 1½ days on delivery by ground methods. The firm remarks in a letter that if a night air service were in operation they would be able to save still another day. Such enterprise deserves success.

## COMPANY NEWS.

### Mortgages, Charges and Satisfactions.

FAIREY AVIATION CO., LTD. (Old Co.)—Satisfaction in full on April 16th, 1921, of charge dated May 12th, 1920, securing £20,000 and further advance.

WHITEHEAD AIRCRAFT (1917) LTD.—Trust deed dated April 25th, 1921, to secure £15,000 deb. stock and such other sum as may be issued under a scheme of arrangement approved by Order of Court dated June 24th, 1920, charged on company's undertaking and property, including uncalled capital, but excluding certain properties at Richmond and Feltham, agreements, goodwill, assets and book debts. Trustees :—O. Sunderland, 15, Eastcheap, E.C., and D. M. Davies, 113, Cottenham Road, Holloway, N.

### Receivership.

MALDEN ENGINEERING AND AIRCRAFT EQUIPMENT CO. LTD.—A. H. Clifford, of 17, Coleman Street, E.C., as receiver by Order of Court dated April 15th, 1921.

**Even in Germany the converted war machine has not yet ceased to masquerade as a commercial type. The photograph shows the Hannover CLV war two-seater, slightly modified and re-christened the Hawa F.6, used as a high-speed passenger carrier.**

**With the 185-h.p. B.M.W. engine the machine has a speed of about 120 m.p.h. at 6,000 ft.**

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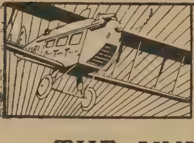
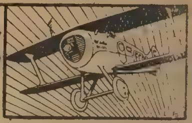


# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.



## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### OFFICIAL NOTICES.

AIR MAIL SERVICES—LATEST TIMES OF POSTING.

I.—London Postal District. *April*, 1921.

| Service (see leaflet). | How posted. | General Post Office | Threadneedle St. B.O. | Lombard St. B.O. | Parliament St. B.O. | Charing Cross B.O. | W.C. D.O. | W. D.O. | S.W D.O. | S.E. D.O. | Other District Head Offices | Sub Districts generally |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| London—Paris ... ... | If handed over counter | 11 0* | 10.45* | 10.45* | 10.25* | 10 45* | 11 5* | 10.45* | 10.40* | 9.0 | 9 0 | Previous Evening 10 p m. to midnight |
| | If posted in public letter box | 9.30 | E.C. District 9 a.m. at larger B.O's and 8.45 a.m. elsewhere | | 9.0 | 8 45 | 10.30†<br>8.45‡ | 10 0†<br>8.30‡ | 10.0†<br>9.0‡ | 9.0†<br>8.30‡ | 8.30 | |
| 2. London—Brussels ... | If handed over counter | 7.15 | — | — | — | — | — | — | — | — | — | — |
| 3. London—Amsterdam ... | If posted in public letter box | At District Offices in time for the first collection at about 6 a.m , or elsewhere in London by the last collections overnight | | | | | | | | | | |
| 4. Rotterdam—Bremen, &c. | If posted in public letter box | p m 6.0 (7 p.m. if a late fee of 1d. is prepaid.) | p.m. 5.33§ | p m, 6 0 | p.m. 5.30 | p.m. 6.0 | p.m. 6.0 | p.m. 6.0 | p.m. 6.0 | p.m. 6.0 | p.m. 6.0 | p.m. 4.15 to 4 30 |

* Registered letters 5 minutes earlier. † At Head Office. ‡ Elsewhere in Town District.

§ And E.C District generally (except Fenchurch St., Ludgate Circus and Throgmorton Avenue B.O's 6.0 p.m.

II.—Provinces.

Letters must be posted in time to be forwarded in Mails for London conveyed by trains due to reach the Lonnon terminus well before the hour of closing the Air Mail at the G.P.O. Precise information should be sought from the local Head Post Office.

General Post Office, London, E.C.1.

## CONTINENTAL ARRIVALS AND DEPARTURES.

[*The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.*]

ABBREVIATIONS:—B.A.—Berkshire Aviation Company. B.C.—Bristol Aeroplane Company. C.A.—Dept. of Civil Aviation. F.R.—Franco-Roumanie G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line K.L. Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes. M W.—Marconi Wireless Telegraph Co. Ltd. N.L.—Nordiska Luftrederi Akticbolaget. P.L.—Petters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aeriéns (S.N.E.T.A.).

## The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

### MAY 2nd:

K.L., Fokker, H-NABG, London-A'dam, 10.06-13.51, G.M., Nil, Holmes
I.L., Vimy, G-EASI, London-Paris, 12.33-14.55, G.M., 11, Barnard.
S.N., DH9, O-BIEN, London-Brussels, 12.34-15.47, G.M., Nil, Catta.
M.A., Breguet, F-CMAJ, Paris-London, 10.45-14.00, G.M., 1, Charpentier.
S.N., DH9, O-BELG, Brussels-London, 11.46-14.55, G M., 2, Sahnovsky.
M.A., Spad, F-CMAY, Paris-London, 12.40-15.35, G.M., Nil, Le Sec.
G.E., Goliath, F-FHMY, Paris-London, 12.55-16.02, G. 9, Labouchere & 1
K.L., Fokker, H-NABJ, A'dam-London, 14.06-18.00, G.M., 3, Duke.
M.A., Breguet, F-CMAG, Paris-London, 16.15-11.46/3rd, G., 2, Paille.

### MAY 3rd:

K.L., Fokker, H-NABJ, London-A'dam, 10.48-15.00, G.M., Nil, Duke.
M.A., Breguet, F-CMAJ, London-Paris, 11.12-13.35, G., Nil, Charpentier.
S.N., DH9, O-BELG, London-Brussels, 13.35-16.30, G.M., 2, Sahnovsky.
G.E., Goliath, F-FHMY, London-Paris, 12.53-15.05, G., 5, Labouchere & 1
M.A., Spad, F-CMAY, London-Paris, 16.04-18.09, Nil, 1, Le Sec.
M.A., Breguet, F-CMAG, London-Paris, 16.04—, Nil, 3, Paille.
M.A., Breguet, F-CMAB, Paris-London, 10.00-13.03, M., 3, Rauge.
I.L., Vimy, G-EASI, Paris-London, 11.20-14.30, G., 11, Barnard.
M.A., Breguet, F-CMAF, Paris-London, 12.35-16.56, G.M., 2, Delily.
K.L., Fokker, H-NABG, A'dam-London, 14.00-17.05, G.M., 2, Olley.
M.A., Spad, F-ACMB, Paris-London, 16.10-18.56, G.M., Nil, Malfanti.

### MAY 4th:

K.L., Fokker, H-NABG, London-A'dam, 12.20-15.14, G.M., Nil, Olley.
M.A., Breguet, F-CMAB, London-Paris, 12.35-15.30, G., 1, Rauge.
I.L., Vimy, G-EASI, London-Paris, 12.38-15.34, G.M , 8, Chattaway.
M.A., Spad, F-ACMB, London-Paris, 16.00-18.55, Nil, 4, Malfanti.
M.A., Breguet, F-CMAF, London-Paris, 16.00-18.54, Nil, 2, Delily.
M.A., Breguet, F-CMAJ, Paris-London, 09.50-16.25, M., 2, Briere.
S.N., DH9, O-BELG, Brussels-London, 13.14-16.55, G.M., Nil, Catta.
M.A., Spad, F-CMAV, Paris-London, 13.15-15.35, G.M , Nil, Le Sec.
K.L., Fokker, H-NABJ, A'dam-London, 14.00-17.09, G.M., 1, Holmes.
G.E., Goliath, F-GEAD, Paris-L'don, 18.00-09.35/5th, G, 8, Labouchere & 1

### MAY 5th:

M.A., Spad, F-CMAV, London-Paris, 10.45-12.44, G., Nil, Le Sec.
G.E., Goliath, F-GEAD, London-Paris, 12.43-15.42, G., 12, Favreau & 1.
S.N., DH9, O-BELG, London-Brussels, 13.27-18.23, G.M., 2, Catta.
M.A., Breguet, F-CMAJ, London-Paris, 15.56-18.15, Nil, 2, Briere.
M.A., Spad, F-ACMB, Paris-London, 09.45-12.25, Nil. 4, Challoux.
I.L., Vimy, G-EASI, Paris-London, 11.15-14.00, G., 8, Chattaway.
S.N., DH9, O-BATA, Brussels-London, 11.45-14.37, G.M., 2, Sahnovsky.
G.E., Goliath, F-FHMY, Paris-London, 12.45-15.32, G., 1, Labouchere & 1
M.A., Breguet, F-CMAB, Paris-London, 16.05-18.39, G., 2, Delily.

### MAY 6th:

K.L., Fokker, H-NABJ, London-A'dam, 10.23-14.00, G.M., 2, Holmes
M.A., Spad, F-ACMB, London-Paris, 12.04-16.00, G., 2, Challoux.
G.E., Goliath, F-FHMY, London-Paris, 12.43-15.17, G., 4, Labouchere & 1
I.L., DH18, G-EAUF, London-Paris, 12.21-15.15, G.M., 8, Powell.
S.N., DH4, O-BADO, Brussels-London, 11.59-14.40, G.M., Nil, Delzenne.
M.A., Breguet, F-CMAF, Paris-London, 12.36-15.05, M., 3, Rauge.
G.E., Goliath, F-GEAB, Paris-London, 12.45-15.30, G., 4, Favreau & 1.
K.L., DH9, H-NABP, A'dam-London, 13.30-18.27, Nil, Nil, Hofftra.
K.L., Fokker, H-NABN, A'dam-London, 14.00-18.28, G.M., 1, Olley.
M.A., Spad, F-ACMA, Paris-London, 16.05-18.23, G.M., 4, Le Men.

### MAY 7th:

K.L., DH9, H-NABP, London-A'dam, 10.55-14.14, G.M., Nil, Hofftra.
S.N., DH9, O-BATA, London-Brussels, 11.31-14.15, G.M., 2, Sahnovsky.
G.E., Goliath, F-GEAB, London-Paris, 12.45-16.33, G., 9, Favreau & 1.
M.A., Breguet, F-CMAF, London-Paris, 13.16-16.28, G., 1, Rauge.
I.L., DH18, G-EAUF, Paris-London, 11.13-13.30, G., 8, Powell.
S N., DH9, O-BIEN, Brussels-London, 12.41-15.47, G M., 1, Catta.
M.A., Spad, F-CMAV, Paris-London, 13.05-15.30, G.M., Nil, Le Sec.
K.L., Fokker, H-NABG, A'dam-London, 14.00-12.32/8th, Nil, Nil, Duke.

### MAY 8th:

M.A., Spad, F-ACMA, London-Paris, 11.20-13.55, Nil, 4, Le Men.
S.N., DH4, O-BADO, London-Brussels, 11.47-14.03, G., Nil, Delzenne.

## The Air Port of Cricklewood.

### MAY 2nd:

H.P., HP, G-EATM, Paris-London, 11.02-14.42, Nil, 9, McIntosh & 1.

### MAY 3rd:

H.P., HP, G-EATN, London-Paris, 11.55-14.35, G.M., 10, McIntosh & 1.

### MAY 4th:

H.P., HP, G-EATN, Paris-London, 11.05-14.10, G., 8, McIntosh & 1.

### MAY 5th:

H.P., HP, G-EATM, London-Paris, 11.55-14.35, G.M., 10, Wilcockson & 1.

### MAY 6th:

H.P., HP, G-EATM, Paris-London, 11.00-13.50, Nil, 10, Wilcockson & 1.

### MAY 7th:

H.P., HP, G-EATK, London-Paris, 12.00-16.20, G.M., 10, McIntosh & 1.

### MAY 8th:

NIL.

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THE VIBRATIONS METHOD OF TUNING UP By INGEGNERE CARLO MAURILIO LERICI.
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## Inland Flying at Croydon.

May 2nd.—S.F., Avro, Brighton return (Muir); S.F., Avro to Stafford (Muir).
May 3rd-4th.—Nil.
May 5th.—S.F., Avro joy-rides (Muir); Avro to Coventry (Muir).
May 6th.—S.F., Avro joy-rides (Muir).
May 7th.—L.A., Avro, Leatherhead return and joy-rides (Hayns); S.F., Avro, joy-rides (Muir); I.L., Vimy, tests (Barnard).
May 8th.—S.F., Avro joy-rides (Muir).

## Inland Flying at Cricklewood.

May 2nd-4th.—Nil.
May 5th.—R.A.F. Bristol "Fighter," Henlow return (Hope).
May 6th.—H.P. O/10 test (McIntosh); B.A., Avro from Hitchin (Robinson).
May 7th.—B.A., Avro to Hitchin (Robinson); H.P. O/10, test (McIntosh).

## Air Port Statistics.

Machines, 65; Passengers, 227; Crews, 79; Total Personnel, 306.
Corresponding Week, 1920:
Machines, 84; Passengers, 126; Crews, 96; Total Personnel, 222.

## The London Terminal Aerodrome.

Further tests of the landing lights at the aerodrome were carried out by a Royal Air Force Handley Page O/400 on Thursday last. The lights are still considered unsatisfactory.

The six-seater Spad is now running regularly for the M.A. The one now in use is painted drab and presents a very business-like appearance.

M. Bouderie's "Goliaths" are doing any amount of work. These machines always look remarkably clean and well kept; a marked contrast to *some* foreign machines.

On arriving at Croydon on Saturday afternoon one found the Trust House lounge largely occupied by a large number of large gentlemen of somewhat Teutonic and elderly aspect. It turned out that these visitors were members of some Danish society in London who had come down to Croydon on purpose to fly. Despite the abominable weather and heavy rain storms the majority of these distinguished foreigners took the air with Mr. Muir, as did three young women who were apparently as fragile as the Danes were solid. The three of them could not have weighed as much as one-and-a-half of Mr. Muir's Danish passengers and it was quite surprising how the excellent Avro managed to haul some of these gentlemen off the earth at all. Altogether Mr. Muir managed to find fourteen passengers, thanks largely to the booking office which is now part of the Basil Foster activities run by Mr. Shaw at the corner by the Enclosure.

Incidentally, the Basil Foster booking office, transport office, garage, etc., now includes a "Bureau de Change," which is capable of tackling most financial and numismatic problems, but Mr. Shaw was thoroughly defeated on Saturday when an official of the aerodrome walked in and solemnly demanded "change for two Sicilian groats."

It has been suggested that the counter of the "Bureau de Change" should be re-organised as a cock-tail bar so that Capt. Glasson or Mr. Leverton might be able to star "Shaw the cocktail mixer at the Hotel Foster, Croydon" as *the* picture at next year's Academy or at the special exhibition now being suggested for those who ought to be hung but are not.

A regrettable incident occurred on Saturday afternoon, when the new six-seater Spad and a S.N.E.T.A. D.H.4 were out on the aerodrome ready to start on the regular 16.00-hour service. The passengers were in the machines and the engine of the S.N.E.T.A. had actually been started when a fairly heavy shower of rain came on. The S.N.E.T.A. taxied out into the aerodrome, but as the rain became worse came back to the point of embarkation.

After sitting there for ten minutes or so the pilots decided to debark their passengers and not to make the journey that day. The result was that half a dozen passengers desirous of getting to Paris or Brussels on Saturday evening were packed back to London again. Naturally, as anyone would expect who knows the habit of April showers, the rain stopped as soon as the passengers climbed out of the machines. Thereafter the machines themselves were returned to the sheds and started on Sunday morning instead

Several of the former A.T. and T. pilots remarked that in their day they would simply have pushed off into the rain knowing that they were going to find fine weather as soon as they got into the Channel. The incident was a very bad advertisement for Civil Aviation.

### The Instone Air Line.

The Instone Air Line have carried 54 passengers during the week. The "Vimy" making the first two return trips in the hands of Messrs. Barnard and Chattaway and Mr. Powell taking over the D.H.18 on Friday and returning on Saturday complete with seven ordinary passengers and Lord Leverhulme. One hopes that if Mr. Reed, who takes photographs of passengers and would-be passengers at the aerodrome, happened to take the Noble Lord's photograph, that gentleman, who should certainly have adopted the title of "Lord Clenzus," will not cut out the face and send the remainder back to Mr. Reed.

Mr. Barnard had the "Vimy" out for a test on Saturday afternoon.

### The Surrey Flying Services.

Mr. Muir has been doing a large amount of work during the week, and the Surrey Flying Services are now rapidly becoming *the* recognised company for most inland flying.

On Monday he went on a photography trip to Brighton and back. Later in the day he went to Stafford. A day or so later he flew to Coventry. While putting the machine into the shed at Coventry, one of the doors fell and smashed the top plane of the Avro on one side. Mr. Muir intends to take another plane to Coventry early this week and fit it there and fly the machine back to Croydon towards the end of the week.

### The Leatherhead Aviation Services.

Mr. Chapman's Avro was being flown on Saturday by Mr. Hayns. The machine with its blue nose and bright spinner, its blue wheels and white struts, looks particularly smart.

### The Flying Dutchman.

Mr. Leverton's Fokkers are carrying on the good work and bringing it back again, with pre-war railway train regularity and reliability. According to a certain scribe Mr. Duke, "the airman composer," composes music while flying between London and Amsterdam, aided and abetted by the Siddeley "Puma" engine. One has often wondered what it was that accounted for some music. One hopes that an enforced descent in the Channel or some equally undesirable spot may never lead to an "unfinished symphony" by Mr. Duke.—G. D.

## The "W.8."

It is understood that Handley Page Transport Ltd. are taking steps to obtain two Napier "Lion" engines to install in the W.8 in order to run this machine on the Paris Service. It will be remembered that the previous pair of engines were only loaned to H.P. Ltd. for the Martlesham competitions, and those, of course, had to be returned at the conclusion of the competition.—G. D.

## Brooklands.

The Vickers works are fairly busy with aircraft work at present. Recently the Napier "Lion"-engined ambulance "Vimy" returned to Brooklands from Martlesham Heath in order to have the undercarriage fitted farther forward and to receive other minor alterations.

The Martinsyde people are said to be constructing an interesting machine in their sheds at Brooklands. One has been unable to confirm the report that it is a cantilever (!) monoplane intended for the Aerial Derby! Mr. Raynham has been in attendance at the Martinsyde sheds recently, with Mr. Handasyde also visiting, for some dark purpose.—J. F. S.

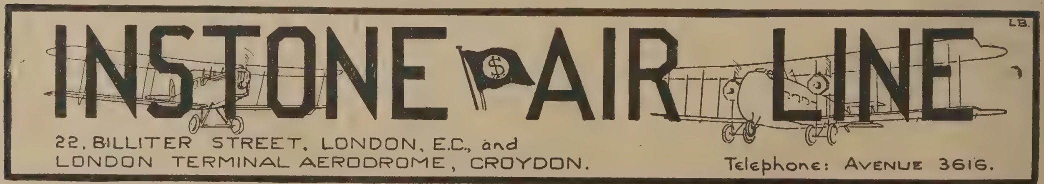
## Wellingborough.

On Monday, April 25th, the Berkshire Aviation Co. began a ten days' flying visit at Wellingborough on a site off Mill Road. So far 175 passengers have been carried, excluding 20 free flight winners from a local paper.

On Wednesday 3,000 copies of the *Wellingboro' Post* were brought over by air from Kettering where a similar flying visit had taken place last fortnight.

No flying was allowed to take place here on Sunday, so Messrs. Holmes, Taylor and Robinson flew over to East Hanney for the day, returning on Monday morning.

The firm are now at Hitchin.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### Woking.

One is informed that the position of affairs at the works of Martinsyde Ltd. is much brighter, and that the receiver is shortly to take his departure. Meanwhile only a few hands are working at the factory.

The Woking police made a raid recently on a cottage at Horsell, Woking, where a man formerly of the R.A.F. was living. On searching the house they discovered a large number of articles alleged to have been stolen from the Royal Aircraft Establishment and the aerodrome at Farnborough. The articles included an undamaged airscrew, motor-cycles, side-cars, airship compasses, magnetos, accumulators, sparking plugs, pilots' helmets and goggles, tools and various parts of aeroplanes. The man was brought before the Aldershot bench on April 20th.—J. F. S.

### MR. TAIT-COX.

His many friends will all be pleased to hear that Mr. L. R. Tait-Cox, the present holder of the British speed record, is now quite recovered from his recent serious illness. Early in the year he caught a severe chill, complications followed, and for some time it was a matter of touch and go whether or not he pulled through.

Now, however, he is practically recovered, and is convalescing at Hythe. Recently he was up in town and seemed to have completely recovered his lost spirits, though it will be some time before he recovers his "avoirdupois."—G. D.

### BRITISH PILOTS FOR CHINA.

British pilots seem to be distributing themselves well over the face of the globe. The latest news is that Messrs. C. R. McMullin, A. Campbell-Orde and O. P. Jones have by now arrived in China, where they are to establish a commercial air service between Shanghai and Peking. Their machines will be the Vickers "Vimys" already supplied to the Chinese Government.

### A NEW MANIFESTATION.

Mr. Alan J. Cobham, who can probably claim to have carried more passengers than any one individual pilot in this country, has now joined the staff of the De Havilland Aircraft Company Ltd. as test pilot. Mr. Cobham was one of the original partners in the Berkshire Aviation Company along with Mr. J. D. V. Holmes. He gave up flying for a period, but found that he was unable to remain with comfort on the ground and therefore took to aerial photographic work. From this he has now been promoted to the de Havilland Company.

### CONGRATULATIONS.

ROE.—On May 1st, at High Firs, Bursledon, to Mr. and Mrs. A. V. Roe, a son.

[Congratulations on the 1921 type Baby Avro.—ED.]

### TO JUGO-SLAV READERS.

A reader in Jugo-Slavia has sent to this office the sum of eight dinars, asking for certain back numbers of THE AEROPLANE. Unfortunately he has omitted to give any name or address. If he sees this paragraph will he be so good as to forward the necessary information so that the numbers may be sent to him?

### WANTED—BACK NUMBERS.

Can any reader of THE AEROPLANE who has back numbers to spare oblige with copies for April 3rd, 17th, and 24th, 1918? A reader of THE AEROPLANE particularly wants copies of those issues, and if any other reader can oblige with them he will be doing a kindness if he will send them to 175, Piccadilly, W.1, marked B.L.

## *AIRCRAFT IN PARLIAMENT*

### HOUSE OF COMMONS.

On April 26th, the SECRETARY OF STATE FOR AIR, in reply to Viscount CURZON, stated that one flying officer is now serving in the fully commissioned ships of the Fleet, and that twelve are serving in aircraft carriers. The remainder of the flying officers for work in co-operation with the Fleet are home on the establishment of the Royal Air Force Base at Leuchars, the establishment of which for 1921-22 is 51, though at present the establishment is incomplete. In addition to these there is another squadron engaged in co-operation with the Navy and available for embarkation. [This last squadron is at Gosport.—Ed.]

On report of the resolution passed in Committee of Supply for an additional number of men for the Air Force, Lieut.-Com. KENWORTHY urged that no case had yet been presented for calling out the Air Force Reserve, and that they ought to be disbanded at the earliest possible moment.

The SECRETARY OF STATE FOR AIR said that the Air Force Reserve consisted of 250 officers and 5,800 other ranks. The weekly expenditure was £24,500. The Air Force was to carry mails should the railways not be running and the road service unsuitable, and to carry urgent communications should there be anything wrong with the telegraph service. The Air Force did very important work in guarding Government stores. "The risk of storming an aerodrome and destroying its inflammable stores would be so simple that nothing could be left to chance." Very generous leave was granted to the officers of the Reserve, who were highly skilled men technically, in order to enable them to make private arrangements with their employers.

The resolution was carried by 173 votes against 26.

## PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]

#### DEATH.

BEBBINGTON.—Accidentally killed at the Aircraft Park, Baghdad, Mesopotamia, on March 16th, 1921, Flight Sergt. Frank Bebbington, R.A.F., beloved husband of Veronica Murray, 3, Sibbald Street, Dundee, N.B.

#### MARRIAGES.

HOLLIS—SIMPSON.—On May 6th, at Trinity Wesleyan Church, Harrogate, by the Rev. J. W. Lightley, Arthur Hollis (late 1/9 Hants and R.F.C.) to Emmeline Mary, eldest daughter of the late Thomas S. Simpson, of 9, Cavendish avenue, Harrogate.

WILLIAMS—BISHOP.—On May 4th, at the North Finchley Wesleyan Church, by the Rev. C. Claud Mayes, B.A., Squadron Leader F. Cartwright Williams, O.B.E., R.A.F., younger son of the late Mr. William Cartwright Williams and Mrs. Williams, of 25, Lewin Road, Streatham, to Hilda, younger daughter of Mrs. and Mrs. E Kelsham Bishop, of Headcorn, Holden Road, Woodside Park, N.

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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... ... ... ... 447
Aircraft Disposal Co., Ltd., The ... ... 445
Arrol-Johnston, Ltd. ... ... ... Front Cover
Auster, Ltd. ... ... ... ... ... Front Cover
Beardmore Aero Engines, Ltd., The ... Front Cover
Beardmore, William, & Co., Ltd. ... ... 439
Bray, Gibb & Co., Ltd. ... ... ... ... 451
Bristol Aeroplane Co., Ltd. ... ... ... 436
Brown Brothers, Ltd. ... ... ... ... 447
Collins, Wm. ... ... ... ... ... ... 445
Cunard Line ... ... ... ... ... ... 452
De Havilland Aircraft Co., Ltd., The... ... 436
Fairey Aviation Co., Ltd., The ... ... ... 431
Falcon Airscrew Co. ... ... ... ... 447
Firth, Thos., & Sons, Ltd. ... ... ... 443
Green Engine Co., Ltd. ... ... ... Back Cover
Imray, Laurie, Norie & Wilson, Ltd.... ... 452
Instone Air Line ... ... ... ... ... 450
MacLennan, John, & Co.... ... ...Front Cover
Metal Airscrew Co., Ltd.... ... ... Front Cover
Napier, D., & Son, Ltd. ... ... ... ... 435
Naylor Brothers (London), Ltd. ... ... 451
New Pegamoid, Ltd. ... ... ... ... 452
Nieuport and General Aircraft Co., Ltd. ... 443
Roe, A. V., & Co., Ltd. ... ...Inside Front Cover
Rolls-Royce, Ltd. ... ... ... ... ... 433
Rubery, Owen & Co. ... ... ... ... 449
Sankey, J. H., & Son, Ltd. ... ... ... 447
Supermarine Aviation Works, Ltd., The Back Cover
Titanine, Ltd. Front Cover & Inside Back Cover
Vickers, Ltd.... ... ... ... ... ... 441
Wireless Press, Ltd. ... ... ... ... 449

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# ON THE JAPANESE-AMERICAN WAR.

You will remember that when Mr. Laughton O. Zigler, the American inventor (in Mr. Kipling's story "The Captive"), was captured together with his automatic gun which had done such good trade for old man Van Zyl's Boers against the British Army he was sent down to Cape Town. On his way down he met at Beaufort West a Kentucky man from Kimberley who said, "A little thing like a King is neither here nor there, but what *you've* done is to go back on the White Man in six places at once—two hemispheres and four continents—America, England, Canada, Australia, New Zealand, and South Africa. . . . Go on and prosper and you'll fetch up by fighting for niggers, as the North did."

Now a good many people, including oneself, feel rather like that about the people who supply war material to yellow or brown or black races and teach them how to use it. Whether they are Russian, Czech, Pole, Jugo-Slav, Afghan, Arab, Bantu, Chinese or Japanese, the fact remains that they are not white and are therefore the natural enemies of the White Race. The difference between teaching Japanese to fly and gun-running in the Persian gulf or on the Pathan Frontier is a matter of degree rather than of kind

But, you will also remember that Mr. Laughton O. Zigler said, earlier in the story, "My gun? . . . For two cents I'd have shipped her to our Filipeens. Why don't I offer it to our army? Well, you've an effete aristocracy running yours and we've a crowd of politicians. The results are practically identical. I am not taking any U.S. Army in mine. . . . And I knew that if she got in her fine work (my gun) I'd stand more chance of receiving an unbiased report from a crowd o' dam-fool British officers than from a hatful of politicians' nephews doing duty as commissaries and ordnance sharps."

Well now! *Mutatis mutandis* the position of Mr. Laughton O. Zigler in the Boer War is very much the position of our aircraft people and our ex-R.N.A.S. people in the matter of Japan. England is not run by an effete aristocracy in these days, but by a bureaucracy very much more crooked and less far-sighted than anything Tammany Hall ever hatched, so there is no real market for men or machines in this country. America is run by a species of politico-commercial aristocracy, which may perhaps best be described as a democracy with lucid intervals, and it also offers no opportunity for our aviators and aircraft

Therefore, like Mr. Laughton O. Zigler, our men and machines have to go where they can prove their worth. And when they get in their fine work that work will be better appreciated by the highly intelligent Americans against whom it will operate than by any hatful of bureaucrats in this country.

Which is by way of an explanation and an excuse, without being in any way a justification of going back on the White Man in six places at once. And, be it remembered, it was South Africa which taught observant Germany the value of machine-guns. Similarly the Japanese-American war may teach the watching World the value of aircraft.

## The Pan-Asiatic Dream.

There are those who deny the possibility of a war between Japan and America. There are others, as well if not better informed, who believe that the war is certain. There are others again who know that it is probable but hope that it will be avoided. Which is just as public opinion was divided before 1914 on the subject of the war between Germany and most of the world. THE AEROPLANE has, at any rate, the satisfaction of having preached the coming of the war with Germany for three years before it began.

All classes may be enlightened by the views of Mr. J. O. P. Bland, lately private secretary to Sir Robert Hart in the Chinese Imperial Customs Service. In his view Japan's idea is the domination of China, for in his book, "China, Japan and Korea," he says that at Peking the predominance of Japanese officials conveys the impression of a protectorate, and he refers to the "violent anti-British Press campaign which broke out and swept over Japan, with scarcely a protesting voice, in 1916, when Germany's star appeared to be in the ascendant." Further he says:—"As it was thirty years ago, so it is to-day—Japan's policy in foreign affairs is directed, not by the Foreign Office, but by the War Office. The voice is the voice of Uchida, but the hand is the unseen hand of Yamagata."

Mr. Bland hopes, on the authority of leading men of all parties in Japan from the Prime Minister downwards, that the liberal and conciliatory policy announced by the Government will triumph over the aggressive policy of the Military Party, and that after Japan has obtained economic ascendancy in China the Military Party may be able to climb down gracefully. "But," he adds, "the Pan-Asian dreamers will bide their time for all that, and the dream itself will never die."

## The Limited View.

Naturally, having lived so long in China, Mr. Bland's view is strongly influenced by, not to say limited to, the situation as between Japan and China. So far as he goes he is probably correct to the last word. But it seems that economic ascendancy in China can only be a means to Japan's end.

The teeming millions of China can only be used to contribute wealth to Japan's campaign of conquest. China is already over-populated and cannot offer an outlet to Japan's surplus population. The Pacific islands, including Australia, the Philippines, and the Dutch East Indies, do offer such an outlet.

A war of conquest in China does not require a huge Fleet and an enormous Naval Air Service. But such sea-going forces are certainly required for the conquest of the Pacific. And Japan is undoubtedly engaged to-day in building the greatest Fleet in the world with a Naval Air Service to match it.

## Protestations and Performance.

So far as the peaceful protestations of the leading men of all parties in Japan are concerned, one is perhaps justified in believing that the political morality of any country is on a par with its commercial morality. And most of the world has discovered during and since the war that Japanese commercial products are seldom if ever "up to sample."

Japanese commercial morals may best be illustrated by a case in point. Some twenty-five years ago, in the height of the cycle boom, a Japanese trader came to Coventry with the highest financial credentials and arranged to take the Japanese agency for a famous bicycle which had a very distinctive trade-mark and had in its design a number of valuable patents. He returned to Japan with a couple of dozen sample machines and left behind a contract for some hundreds of others at special export prices.

In due course he wrote a most polite and businesslike letter stating that on arriving in Japan he had shown the samples and was assured that there would be a very big sale for these excellent bicycles. Consequently he had registered the trade-mark in Japan as his own property and had taken out Japanese patents in his own name for all the patentable points in the design. Therefore he suggested that if the Coventry firm desired to take advantage of the great market open to its goods in Japan it would be advisable for the firm to reduce very considerably the export price named in the contract which he had placed. If the firm did not agree then he would be regretfully compelled to manufacture these bicycles in Japan himself, for it would be impossible for anybody else to sell them there as he owned the trade-mark and patents.

Personally one would rather back the open and honest militarism of the fighting caste than commercial and political methods of that kind. Therefore one is prepared to gamble on a big war for the mastery of the Pacific. And when Japan attempts to grasp the command of the Pacific the United States of America must assuredly fight Japan.

## The Unwanted Philippines.

There are, of course, those in the States who would rather surrender American possessions in the Pacific than fight Japan for them. There were, after the Spanish-American War, those who would rather have left the Philippines to misgovern themselves than have fought even the Sultan of Sulu, that comic little potentate who was "unable to reproduce his species," let alone Aguinaldo and the Igorotes, for the control of the islands. Quite recently one had a long talk with a most charming American, a man of very high standing in the States, who frankly disbelieved in any possibility of war with Japan over the Philippines and said in effect that if Japan wants the islands she had better have them.

It seems in truth that although the Philippines do in fact pay for their keep they do not supply anything that America cannot buy just as cheaply on the open market. Even the best-informed of Americans seem a trifle hazy as to what the States do get from the islands. One such, evidently having the name Manila in mind, could only think of hemp as the chief export. And when one remembers that the States have taken of late to electrocuting all their best criminals there seems little enough reason for fighting Japan over the supply of hemp from Manila. Also, with Cuba so close at hand, the cessation of the supply of Manila cigars could scarcely be an adequate *casus belli* for the States.

### National Prestige.

What is far more important than any question of exports and imports is the matter of national honour and prestige. If America lets Japan take the Philippines without kicking, then the next step is the surrender of Hawaii. After that the Japanese, who are in fact a Northern race, can commandeer Alaska with all its gold and coal. And from that to the conquest of California is not a very great stride.

During the Civil War in America the North was afflicted with "copper-heads" whose sympathies on purely sentimental grounds were with the South. They had at any rate the justification that the majority of the gentlefolk of America lived in the Southern States. During the recent war we in this country had a certain number of pro-Germans. They also had some justification, in that a German victory would have meant the triumph of science, law, order, and military aristocracy, which are apparently lacking in our present blend of bureaucracy and bankruptcy. But one fails utterly to see any advantage to be derived by any White Nation from the ascendancy of the Yellow Race in the Pacific.

Therefore it seems to be the natural duty of every white man whether directly concerned with the Pacific Ocean or not to combat to the utmost any rise to power of any other race. And any copperhead faction which shows itself in the States ought to be firmly and not too gently suppressed.

### Drastic Methods.

In 1905, which was some little time before the European War, the late Walter Staner, the editor of the *Autocar* and one of God's best and wisest men, said in the course of a little personal argument that if the British Empire had a Government worth having the Peace of Europe could be preserved for the rest of the century by sending the British Fleet into the North Sea and the Baltic and blowing the Kiel Canal and all Germany's Naval ports, forts, and establishments into the water. Events have shown the soundness of his judgment.

Similarly if the United States had a strong enough Executive the Peace of the Pacific could be preserved for half a century at least by applying an equally drastic method to Japan's centres of Naval and Military aggrandisement. But, knowing something of American politicians, one can say definitely that no such thing will be done. Therefore the best that enlightened Americans can do is to devote themselves for the next year or two entirely to the task of preparing their fellow-countrymen for the war which they must fight sooner or later.

In a previous article one hazarded the opinion that this war must come about 1924, because the Japanese Navy and Air Service cannot be ready before then, and because after that date the United States' Navy will be too powerful for Japan to tackle it with any hope of success

At the present moment the flying services of the U.S. Army and Navy combined are strong enough to bomb the Japanese arsenals to destruction if transported to a base in Korea under escort of the U.S. Fleet. But in two or three years' time the position will very probably be reversed, if nothing happens to hinder Japan's preparations for war. One proposes to deal with those preparations in the next article.—C. G. G.

(*To be continued.*)

## VULGARISATION.

The following letter has been received :—

Sir,—It is perhaps a work of supererogation to congratulate "C. G. G." upon the felicity of his phrasing. Yet even for him the title of a recent article—"The Vulgarisation of Aviation"—marks a distinct triumph.

Yet is there not some inconsistency between this particular article and the writer's standard attitude towards the *Daily Mail*? Has the *Daily Mail* ever been anything but the most effective organ of vulgarisation the world has yet seen? And has the *Daily Mail* dealt any less faithfully with aviation than it has with other subjects? Nevertheless, the article is of great interest and has its lessons for industries other than aeronautical.

Why should the S.E. and C.R. not seek to enhance its depleted revenues by a propaganda for the vulgarisation of rail-roading? Let it arrange for the annual R.E. (Railway Section) Pageant to be held at Charing Cross and provide facilities there for private locomotive drivers and firemen to carry on railway joy-ride enterprises. Those who cannot in the ordinary way afford to travel by train might thus at least taste the joys of strap-hanging.

An exhibition of loco. stunting on Hungerford Bridge would attract vast crowds, if proper public enclosures ensuring a good view were erected. The chance of seeing a really good crash in the middle of the bridge, with the prospect of the crasher diving into the Thames below, would be as great an attraction as a Cup Final—and surely no one could be so short-sighted as to object if it became necessary, owing to the congested condition of Charing Cross, to make Waterloo Junction the West End terminal for all South-Eastern passenger traffic? Yours faithfully,

(Signed "Pleasure Before Profit."

[Where Mr. P.B.P. "misses the 'bus" is that all the suggested events can be held at Croydon without interfering with the traffic. And, anyhow, Charing Cross as a "venue" would be enough to choke anybody off travelling, except under stress of circumstances.—C. G. G.]

## NAVAL AND MILITARY AERONAUTICS.

### Japs at Kenley.

The Crown Prince of Japan and sundry attendants visited the R.A.F. Station at Kenley on May 16th. He was received by H.R.H. the Duke of York, who was attended by Capt. the Hon. James Stuart his Aide-de-Camp, and by Air Vice-Marshal Sir John Salmond and Sqd. Ldr. Johnston, O.C. Kenley. After being impressed by the guard of honour the Japanese Prince made a tour of the aerodrome sheds, workshops and men's quarters, showing a very keen interest in the machines.

Captain F. E. Guest, Secretary of State for Air, presided at the luncheon, after which a display of flying was given, consisting of aerial manœuvring and formation flying, concluding with a bombing attack on an imaginary trench line. Four Japanese made short flights as passengers.

Huge crowds collected in the vicinity of the aerodrome, the surrounding roads being packed with people Quite a pretty display of flying was given by Mr. Luxmore on a Snipe and Mr. Leroy on a De Havilland. Sundry Bristol fighters evoluted excellently and another De Havilland dealt almost adequately with a Press photographer who, however, escaped.

### Short Service Commissions in the R.A.F.

The following announcement was made by the Air Ministry on May 12th :—The next course for Officers granted short service commissions in the Royal Air Force by direct entry from civil life will commence on July 1st, 1921.

The Selection Committee will sit at the Air Ministry on June 1st, 2nd and 3rd to interview candidates.

Intending candidates should make written application for full particulars to the Secretary, Air Ministry, not later than May 20th.

### 208 Squadron Association.

When 208 Squadron held its last re-union dinner it was announced that the formation of an Old Comrades' Association would be taken in hand. This is now in process of formation and everybody associated with 208 Squadron R.A.F. or No. 8 Naval Squadron is invited to send in their name to the Secretary, Mr. J. Wyatt, 208 Squadron Association, 15, Queen Anne Street, Cavendish Square, W.

The object of the Association is to continue the comradeship of past and present members of the Squadron (a) by assuring the continuance of the annual re-union dinner; (b) by maintaining full records of addresses and occupations of past members of the Squadron; (c) endeavouring to find employment for those who are unemployed; and (d) assisting as far as possible members in distress. The committee have wisely put the objects in that particular order, for it is obvious that the fulfilment of each object rises out of the success of the previous object. Those who are in distress can only be helped by those who are in employment. Those who are out of employment can only be put into employment if their names and addresses are known to the Association, and the real spirit of comradeship can best be maintained by as many former members of the Squadron as possible meeting at the annual dinner.

The subscription to the Association is 5s. per annum, which may be paid in two instalments if so desired, but those who can contribute more are asked to do so in the form of a donation towards the establishment of the Association. Everybody who has served at any time with No. 8 Naval or 208 R.A.F. Squadron is qualified for membership.

Obviously the first thing to do is to make a success of the annual dinner. In these hard times with high railway fares and hotel difficulties it is not usual for those who live far from London to attend, but to overcome this it is proposed that members living near London shall, where possible, offer hospitality for the night of the dinner to comrades who come from a distance. Moreover, those who are not in a position to come from a considerable distance owing to the high railway fares will be assisted so far as funds permit. Those who would be prepared to put up an old friend for the night are particularly asked to communicate with the Secretary.

At present the Secretary has the names and addresses of about 400 old members of the Squadron, but many more are wanted and all who read this notice are asked to bring it to the attention of any old comrade who does not already know of the Association. Furthermore, the Secretary will be pleased to give to former members of the Squadron addresses of any old friends with whom they may wish to get in touch, provided they happen to be on his list.

Even those who in the present bad state of business cannot afford to join the Association are at any rate asked to send in their names and addresses so that if opportunity offers the Association may help them. Officers and men formerly of 208 who are still in the R.A.F. are also asked to send in their names, as it is particularly desired that past and present members of the Squadron should be kept in touch even if those at present serving are not in the existing 208 Squadron. One particularly commends this to all readers who have served with the Squadron and one asks them to communicate at once with the Secretary.

### The W.R.A.F. Old Comrades Association.

Owing to a misunderstanding the account of the annual meeting of the above association in this paper dated April 6th stated that the affiliation of the O.C.A. with the Women's Services' Association would entitle it to a grant from the Canteen Funds. The President of the O.C.A. points out that everyone who served in the War is eligible for the benefits of th Canteen Funds, and the affiliation of the O.C.A. with the Service Women's Association merely means that the O.C.A. will be represented in the administration of the funds.—C. M. S. H.

## AUSTRALIA.

### Air Service Programme.

In the Senate at Melbourne on April 22nd, Mr. Pearce, the Minister for Defence, during the debate on the second reading of the Air Force Bill, which provides for the creation of permanent air forces, said that 72 machines were at present on the establishment and 79 surplus machines were also held. The reserve, he said, should be 50 per cent. of the total establishment.

## CANADA.

### Air Welcome For Presentation Squadron.

The arrival of H.M.S.'s *Aurora*, *Patriot*, and *Patrician*, a light cruiser and two destroyers, presented to the Canadian Navy by Great Britain, at Vancouver, was welcomed by two flying boats from Jericho Air Station. An F.3, piloted by Major McLaurin, D.S.C., and an H.S.2.L., piloted by Major B. D. Hobbs, D.S.O., D.S.C., took part in the welcome, meeting the squadron some distance out in the Gulf of Georgia, and escorting it back to the anchorage in English Bay.

### Jericho Air Station.

Jericho Air Station, Point Grey, Vancouver, B.C., has been adopted by the Canadian Government as the western seaplane training station for the Canadian Air Force. Two large hangars and a new machine shop will shortly be erected at an approximate cost of 75,000 dollars, and a 5,000-gallon petrol tank will be installed. The first four officers to undergo a course in flying-boats reported at Jericho on February 15th. Twelve officers and fifty mechanics will receive instruction in one course, and it is expected that 100 pilots will be trained there this summer.

Besides F.3s there are two H.S.2.Ls, fitted with modified hulls known as the "Jericho" pattern, designed by Major McLaurin. This pattern, which has the seating accommodation modified and enlarged, so as to reach from the main planes forward to, and including, the forward cockpit, and which has special fittings for aerial camera, etc., has been adopted by the Air Board, and all new hulls will be built in accordance with it.

When the station is fully equipped it will have eight flying-boats, four hangars, as well as workshops, barracks, a huge concrete quay with launching ways, etc.

In addition, a fair amount of civil flying will be carried out, more particularly in connection with forest surveys, the mapping of salmon spawning grounds, experimental photography, etc. Owing to the mountainous nature of British Columbia, aircraft are of the greatest value in exploration work, as it has been possible to fly over portions of mountain wilderness which it would be impossible to reach on foot.

## SOUTH AFRICA.

### The South African Air Force.

According to the *Motor Weekly* of Bloemfontein, S.A., the composition of the South African Air Force has been decided on, and in an obviously inspired statement circulated by Reuter to the S.A. Daily Press it is stated that the programme for 1921-22 is to establish a Headquarters Depot with at least one squadron of three flights each of six machines, and the present proposal is to establish another squadron during 1922-23.

The Director of Air Services, Col. Sir H. van Ryneveld, and a small band of officers and men of the permanent force, all of whom have had active service experience, are at present actively engaged in laying out what may be termed the foundation of the new structure.

The inception of the S.A. Air Force will be made entirely with the generous gift of aircraft equipment made by the Imperial Government. This gift is made up as follows:—100 aeroplanes complete with engines; 28 spare engines; 250 transport vehicles, including workshop-lorries, 3-ton lorries, light tenders and cars, motor cycles and trailers; steel framework for 20 permanent hangars; 30 Bessonneau hangars; complete W.T. equipment for fitting up 2 squadrons; complete photographic material for equipping 2 squadrons; 50,000 gallons of aero engine oil; 20,000 gallons of paints, varnish and dope; tools completely to equip the S.A.A.F. mechanics; spares to maintain all the above for one year and complete workshop machinery to enable any kind of aeroplane, aero-engine and transport repair and overhaul work to be done.

Ninety-eight per cent. of this equipment is now in South Africa, and at present the Depot, with all its repair sections, is being organised.

Negotiations have been opened for the purchase of suitable land adjoining Roberts Heights for an aerodrome, but owing to the exorbitant price asked, it has become necessary for the Government to expropriate land. When the ground organisation is complete, the requirements of the Air Force will be advertised throughout the Union, so that everybody who took an active part in the Air Services during the War will have an opportunity of joining. In the case of commissioned appointments to the Air Force, the aim will be to make all officers flying officers.

The first commissioned appointments will be made from applications received as the result of advertising. The selections will be made by the Minister of Defence, and appointments will be made only and when the occasion demands.

Subsequent appointments will be made from selected candidates from the public schools and colleges and from the non-commissioned ranks.

Air Force commissions for periods of 3 years will be granted after 3 months' probation, and may be renewed for periods of 3 years until Lieutenants retire at the end of the period during which they attain the age of 30 years, and Captains at the end of the period during which they attain the age of 35 years.

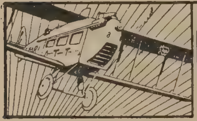
Officers who are promoted to the rank of major will be offered permanent commissions. The pay of all officers will be exactly as for the permanent force, and, with the exception of officers who attain the rank of major and accept permanent commissions, will be entitled to a gratuity of £100 for each completed year of service.

Non-commissioned appointments will be filled as the occasion demands from selected applicants after satisfactorily passing the trade tests or satisfactory apprenticeships, and will be appointed for similar periods, after short terms of probation.

## UNITED STATES OF AMERICA.

### An Aerial Survey on the Mississippi.

Mr. W. H. W. Komp, an assistant sanitary engineer, United States Public Health Service, stationed at Jackson, Mississippi, applied to the Chief of the Air Service for pilots, observers and machines to be lent for the purpose of making an aerial survey of an area of fifteen square miles in which are situated the towns of Rosedale, Cleveland and Marigold, Miss. This tract is flat, intersected by shallow, sluggish streams, with heavily timbered banks. The Chief of the Service replied on March 16th, 1921, agreeing to carry out the survey and stating that this work would be given priority. The work should be finished at the latest by the end of July.



# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.

## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS:—B.A.—Berkshire Aviation Company. B.C.—Bristol Aeroplane Company. C.A.—Dept. of Civil Aviation. F.R.—Franco-Roumanie. G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line K.L. Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes. M W.—Marconi Wireless Telegraph Co. Ltd. N.L.—Nordiska Luftrederi Akticbolaget. P.L.—Petters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aeriéns (S.N.E.T.A.).

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

**MAY 9th:**

M.A., Breguet, F-CMAB, London-Paris, 11.03-13.50, G., 1, Delily.
K.L., Fokker, H-NABN, London-A'dam, 11.18-14.38, G.M., 1, Olley.
I.L., Vimy, G-EASI, London-Paris, 12.30-15.25, G.M., 4, Chattaway
M.A., Spad, F-CMAV, London-Paris, 15.55-18.15, Nil, Nil, Le Sec.
M.A., Spad, F-ACMB, Paris-London, 09.50-12.20, G.M., 5, Challoux.
S.N., DH9, O-BELG, Brussels-London, 11.59-15.00, G.M., 1, Sahnovsky.
G.E., Goliath, F-FHMU, Paris-London, 12.52-15.26, G., 12, Favreau & 1.
M.A., Spad, F-CMAY, Paris-London, 12.40-14.42, G., Nil, Malfanti.
K.L., DH9, H-NABP, A'dam-London, 14.00-17.10, G., 1, Hofstra.

**MAY 10th:**

M.A., Spad, F-CMAY, London-Paris, 10.10-12.25, G., Nil, Malfanti.
K.L., Fokker, H-NABJ, London-A'dam, 10.12-13.29, G.M., Nil, Duke.
S.N., DH9, O-BELG, London-Brussels, 13.20-15.42, Nil, Nil, Sahnovsky.
S.N., DH9, O-BIEN, London-Brussels, 13.22-15.43, M., Nil, Catta.
C.A., Viking, G-EAUK, London-Paris, 15.30-17.30, Nil, 2, Cockerell.
M.A., Spad, F-ACMB, London-Paris, 16.24-18.50, G., 4, Challoux.
G.E., Goliath, F-FHMU, London-Paris, 17.05-19.45, G., 6, Favreau & 1.
M.A., Breguet, F-CMAI, Paris-London, 09.30-12.00, M., 3, Rauge.
I.L., Vimy, G-EASI, Paris-London, 11.20-13.58, G., 9, Chattaway
S.N., DH4, O-BADO, Brussels-London, 11.45-14 27, M., 2, Delzenne.
M.A., Breguet, F-CMAF, Paris-London, 12.53-15.31, G.M., 2, Briere.
G.E., Goliath, F-FHMY, Paris-London, 12.59-15.48, G., 12, Labouchere & 1
M.A., Breguet, F-CMAB, Paris-London, 16.30-19.27, M., 3, Paille.
K.L., Fokker, H-NABJ, A'dam-London, 15.07-18.50, M., 2, Holmes.

**MAY 11th:**

K.L., DH9, H-NABP, London-A'dam, 10.06-14.07, G.M., Nil, Hofstra.
M.A., Breguet, F-CMAF, London-Paris, 10.30-13.30, G., 2, Briere.
I.L., DH18, G-EARO, London-Paris, 12.30-15.20, G.M., 3, Powell.
G.E., Goliath, F-FHMY, London-Paris, 12.45-15.45, G., 3, Labouchere.
S.N., DH4, O-BADO, London-Brussels, 13.00-15.55, G.M., 2 Delzenne.
M.A., Breguet, F-CMAI, London-Paris, 16.00-19.00, G., 1, Rauge.
M.A. Spad, F-ACMA, Paris-London, 09.45-11.55, G.M., 4, Le Men.
C.A., Viking, G-EAUK, Paris-London, 10.20 12.55, Nil, 2, Cockerell.
M.A., Spad, F-CMAV, Paris-London, 10.25-12.57, Nil, 2, Delily.
S.N., DH9, O-BELG, Brussels-London, 11.50-14.21, M., 2, Sahnovsky.
S.N., DH9, O-BATA, Brussels-London, 11.54-14.15, G., 2, Wouters.
G.E., Goliath, F-GEAB, Paris-London, 12.45-14.54, G.M., 5, Bechler.
M.A., Spad, F-CMAY, Paris-London, 12.55-14.54, G.&M., Nil, Malfanti.
K.L., Fokker, H-NABL, A'dam-London, 14.00-17.20, G.M., 2, Olley.
M.A., Breguet, F-CMAA, Paris-London, 16.10-18.27, M., 2, De Perignon.

**MAY 12th:**

K.L., Fokker, H-NABJ, London-A'dam, 10.15-14.00, G.M., Nil, Holmes.
M.A., Breguet, F-CMAB, London-Paris, 10.20-13.10, G., Nil, Paille.
G.E., Goliath, F-GEAB, London-Paris, 12.34-15.58, G., 8, Bechler & 1.
S.N., DH9, O-BELG, London-Brussels, 12.28-15 05, G.M., 1, Wouters.
M.A., Spad, F-CMAY, London-Paris, 16.08-18.15, Nil, 2, Malfanti.
M.A., Spad, F-CMAY, London-Paris, 16.10-18.30, G., 1, Delily.
I.L., DH18, G-EARO, Paris-London, 11.20-13.25, G., 7, Powell.
S.N., DH4, O-BARI, Brussels-London, 11.59-14.13, G.M., 2, Delzenne.
M.A., Breguet, F-CMAF, Paris-London, 13.10-17.06, G.M., 2, Charpentier.
G.E., Goliath, F-FHMY, Paris-London, 12.49-17.25, G., 3, Labouchere & 1
K.L., Fokker, H.NABN, A'dam-London, 14.00-17.08, G.M., 3, Duke.
M.A., Breguet, F-CMAI, Paris-London, 16.15-18.20, M., 1, Challoux.

**MAY 13th:**

K.L., Fokker, H-NABL, London-A'dam, 12.10-17.20, G.M., 2, Olley.
I.L., DH18, G-EAUF, London-Paris, 12.22—, G.M., 8, Chattaway.
M.A., Spad, F-ACMA, London-Paris, 14.02-16.30, G., 3, Le Men.
M.A., Breguet, F-CMAL, London-Paris, 14.08—, Nil, 2, Challoux.
M.A., Breguet, F-CMAA, London-Paris, 14.10—, Nil, 3, De Perignon.
G.E., Goliath, F-FHMY, London-Paris, 14.11-17.05, G., 13, Labouchere & 1
S.N., DH4, O-BARI, London-Brussels, 15.40-18.23, G., 2, Delzenne.
S.N., DH9, O-BATA, London-Brussels, 15.42-18.25, M., 2, Sahnovsky.
S.N., DH9, O-BELG, Brussels-London, 11.45-15.12, G.M., 2, Catta.
G.E., Goliath, F-FHMU, Paris-London, 13.03-16.10, G., 4, Favreau & 1.

**MAY 14th:**

I.L., Vimy, G-EASI, London-Paris, 13.25-16.10, G., 11, Barnard.
G.E., Goliath, F-FHMU, London-Paris, 13.07-16.05, G., 12, Favreau.
S.N., DH9, O-BELG, London-Paris, 16.12-17.45, G.M., 2, Catta.
K.L., Fokker, H-NABM, London-Amsterdam, 16.11—, G.M., 2, Duke.
M.A., Spad, F-CMAB, Paris-London, 15.50-18.00, 2, Malfanti.
M.A., Spad, F-ACMA, Paris-London, 16.30-19.06, G.M., 2, Paille.
I.L., Vimy, G-EASI, Paris-London, 17.15-20.15, Nil, 9, Barnard.

**MAY 15th:**

M.A., Spad, F-ACMA, London-Paris, 11.24-15.00, Nil, 4, Paille.
I.L., DH18, G-EARO, London-Paris, 12.04-14.35, Nil, 6, Powell.
I.L., DH18, G-EARO, Paris-London, 15.30-18.15, Nil, 6, Powell.
K.L., Fokker, H-NABJ, A'dam-London, —18.15, G., Nil, Hofstra.
M.A., Breguet, F-CMAI, Paris-London, —18.40, G., Nil, Rauge.
M.A., Spad, F-CMAV, Paris-London, —18.44, G., Nil, Delily.

### The Air Port of Cricklewood.

**MAY 9th:**

H.P., HP, G-EATK, Paris-London, 11.35-14.45, G., 10, McIntosh & 1.

**MAY 10th:**

H.P., HP, G-EATN, London-Paris, 12 00-15.20, G.M., 7, Wilcockson & 1.

**MAY 11th:**

H.P., HP, G-EATN, Paris-London, 11.20-14.00, G., 9, Wilcockson & 1.

**MAY 12th:**

H.P., HP, G-EATK, London-Paris, 12.00-15.20, G.M., 10, Wilcockson & 1
H.P., HP, G-EATM, London-Paris, 12 05-15.30, Nil, 9, Rogers & 1.

**MAY 13th:**

H.P., HP, G-EATM, Paris-London, 11.15-14.40, G., 9, Rogers & 1.
H.P., HP, G-EATK, Paris-London, 11.25-14.40, Nil, 10, Wilcockson & 1.

**MAY 14th:**

H.P., HP, G-EATM, London-Paris, 11.55—, M., 10, Rogers & 1.
H.P., HP, G-EATN, London-Paris, 12.05—, Nil, 10, McIntosh & 1.

### Air Port Statistics.

CONTINENTAL.

Machines, 82; Passengers, 313; Crews, 101; Total Personnel, 414.
Corresponding week last year:—
Machines, 75; Passengers, 163; Crews, 87; Total Personnel, 250.

### Inland Flying at Cricklewood.

May 9th-10th.—Nil.

May 11th.—R.A.F. Bristol from Henlow return (Hope); H.P. D.H.4a, two tests (Perry).

May 12th-15th.—Nil.

### The London Terminal Aerodrome.

An eventful week. A record number of passengers and plenty of machines. On Tuesday Messrs. Cockerell and Broome on the "Viking III" flew to Paris and alighted on the Seine. The machine left the following day with Sir F. H. Sykes and M. Eynac, the French Under Secretary of State for Air, as passengers. They alighted on the Thames within two hours of leaving the Seine—a remarkable performance. The machine returned to Croydon carrying the American Air Attaché.

This was the first time the Air Post Port of Westminster has been used by a machine incoming from the Continent.

On Friday the big Spad was reported missing in that fog which delayed everyone. It is reported that she discontinued "somewhere in France."

M. Didier's Breguets and Spads have been working hard during the week, as have M. Bouderie's "Goliaths."

One learns that two D.H.6s, flown by Messrs. Dalton and Reid, and belonging to the Brompton Motor Company, called at Croydon on this Monday, en route for the Isle of Wight. Those who should be were present in the Trust House on Monday evening, including Mr. W. W. Glenn, late assistant to Major Greer at the Aerodrome, after a trip to India, and all is good again.

THE INSTONE AIR LINE.

Messrs. Powell and Chattaway took the D.H.18 over and back in the first four days of the week.

On Thursday a long high test flight on D.H.18 G-EAUF with Mr. Barnard over Sutton, Banstead and Leatherhead. Up to 3,500 feet. The machine, when put to it, climbed from 2,000 to 3,500 in about a minute. It was noticed that the high speed of the machine was 122 m.p.h., and she stalled at 59 m.p.h.

The following day Mr. Chattaway and eight passengers

(Continued on page 469.)

**Telegraphic Address**
*Adresse Télégraphique:*
Dirección Telegráfica:
**"AIRILY, HAYES, MIDDLESEX."**

**Codes:**
*Codes:*
Codigos
**A.B.C. (5th Edition).**

**The Fairey Aviation Company,**
LIMITED.

**CONTRACTORS to BRITISH ADMIRALTY, WAR OFFICE and AIR MINISTRY.**

*Fournisseurs des Ministères de la Guerre, de la Marine et de l'Air.*

Proveedores del Almirantazgo, Departamento de Guerra y Ministerio de Aviación Británicos.

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*Siège Social*—Oficina Principal.
London Office - - - - 175, PICCADILLY, LONDON, W.
*Bureau de Londres*—Oficina de Londres.
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**Sole Patentees of the Fairey Patent Variable Camber Gear for Aeroplanes, Seaplanes and Flying Boats.**

*Seuls détenteurs du brevet Fairey pour dispositif de cambrure variable pour aéroplanes, hydravions et bateaux volants.*

Unicos poseedores de la patente Fairey de dispositivos de combeo variable para aeroplanos, hidroaviones y barcos aéros.

**Designers and Manufacturers of all classes of Seaplanes, Flying Boats, Aerodromes, Amphibian Aircraft, Aircraft specially fitted for Survey and Photographic purposes, Floating Hangars, and complete equipment for same.**

**Designers by special request of the largest Flying Boat built for the British Government.**

**Contractors for the laying out and complete equipment of Passenger, Mail and Express Goods Services by Aircraft.**

**Designers and Manufacturers of the Fairey Type III. Series of Machines as supplied in quantity to the British Government during the War and since its termination. In this series of Machines the Fuselage, Centre Plane, Tail Unit, etc., are standard and are adapted to take different types of wings, chassis and engines of other Machines of the series to suit the particular purpose for which the machine is required. All machines of this type have folding wings and are fitted with our patent Variable Camber Gear giving high performance and lifting power combined with low landing speed.**

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## THE WEEKLY COMMENTARY.

In a series of articles entitled "On Variable and Other Wings," the subject of uses of wings possessing variable characteristics, such as the variable camber and variable surface types, will be discussed. The manners and habits of such wings, and the difficulties attendant on their use are not very widely known or appreciated, and the articles in question represent an attempt to discuss them in a simple yet accurate manner.

In the first article below the type of wing which is fitted with trailing edge flaps—largely used by the Fairey Aviation Company—is considered.

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The latest type of commercial monoplane built by the Dutch Fokker Company, and used on the K.L.M. air service, is described and illustrated on page 462.

An Albatros monoplane of a type somewhat similar to the above-mentioned Fokker is also described in this issue (page 466).

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A brief abstract of a paper by Mr. Ricardo, dealing with his experiments on supercharged engines, will be found on page 466.

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A short account is given on page 468 of the general nature of the theory evolved by German aerodynamic investigators to account for the effects of aspect ratio on the characteristics of an aerofoil.

## ON VARIABLE AND OTHER WINGS.—I.

In these days when all kinds of wild wings are continually being invented it seems worth while to discuss and to consider what are the gains which can be achieved by improvement in wing forms, and to what extent the advantages claimed by the inventors of sundry abnormal types of wing can be attained by alternative methods already known. It is a noteworthy fact that practically all the wings which have recently been invented are high lift wings, and that they are specifically advocated particularly for the use of commercial aircraft.

Those who have read this paper consistently for the last two years may remember a series of articles on the "Design of Commercial Aircraft," wherein the value of high lift wings for commercial purposes was demonstrated at some length.

For the benefit of those who did not read or who have forgotten these articles it will be well to recapitulate some of the main arguments in favour of high lift wings.

### The Characteristics of Fixed Wings.

With any form of fixed wing profile there is a definite angle of incidence which corresponds to the maximum lift, and therefore to minimum or landing speed. The actual landing speed is governed for any given wing by the loading of that wing, and if one doubles the loading, one necessarily increases the landing speed to the extent of about 41 per cent.

At some other less angle of incidence each wing has a maximum value of L/D, which means for a given total weight carried the minimum of thrust is needed to drive the wings themselves through the air. That is if the best L/D of a given wing is 20, then the thrust required to pull those wings when the wings are carrying 1 ton of total weight is 1-20 ton—112 lbs. This is true, roughly, whether the wings are carrying 1 ton per sq. ft. or 1 ton per sq. mile. It is not true really because either of these loadings on any practicable wing would involve a speed of flight outside of the range in which the law that the resistance of the air is proportional to the square of the speed is valid.

But although the thrust at the angle of best L/D is independent of loading, the speed is not, and increasing speed must accompany increased loading. But, whatever the loading, for the same wing the speed at maximum L/D, or the speed of minimum thrust, always bears a fixed relation to the minimum, or landing speed, of flight. For wings of the type most commonly used this speed of minimum thrust is about 40 to 50 per cent. greater than the minimum speed.

### The Value of High Wing Loading.

Obviously to obtain a given speed at the least expenditure of power it is desirable so to arrange matters that at the desired speed the wings are at minimum thrust angle. This can be arranged by adjusting the loading of the wings properly. For instance, if one wishes a speed of 100 m.p.h. for the least possible power one would take a wing such as R.A.F.15 and load it to 15 lb. per square foot or so.

But one will then find that the minimum possible speed—the landing speed practically—has gone up to somewhere round 70 m.p.h. at least. This adds greatly to the dangers of landing and getting off, and so heavy a loading on such a wing could not be tolerated on this ground alone, except for purely racing purposes

The high loading has other disadvantages and other advantages. Taking the advantages first, it means that for a given total weight smaller wings are needed. In addition to saving shed space, this means lighter wings, and therefore more useful load for a given total weight.

The main disadvantage is that there is inevitably a loss in climb and in ceiling for a given weight per h.p.

By using a high lift wing it becomes possible to increase the loading on the wings without increasing the landing speed. The speed of minimum thrust in a good high lift wing is a somewhat larger multiple of the minimum speed than in the more usual type of wing. That is instead of the minimum thrust occurring at a speed 45 per cent. higher than the minimum, it will occur at a speed, say, 55 per cent. higher. Against this the actual best L/D is lower and therefore the minimum thrust is greater.

### Different Characteristics Needed for Different Uses.

If one is designing for a very moderate top speed, 60 to 100 per cent. above minimum speed, a high lift wing can be used, and will give this top speed for a slightly lower h.p. per ton weight, or alternatively for a loading of slightly more lbs. per h.p. And at the same time one gains all the advantages of smaller wings, smaller wing weight, and consequently, for a given total weight a larger useful load. This with a better climb and a better ceiling, and a quicker get-off than one could attain with the low lift wing equally heavily loaded.

But if one wishes to make the top speed more than twice the landing speed, one has of necessity to obtain that high speed at an angle of incidence considerably finer than that of best L/D, whatever type of wing one may use, and, unfortunately, the L/D of the high lift wing falls off very much more rapidly than does that of the high speed low lift type. This fact renders the best high lift wings yet known extremely inefficient for such a top speed.

### The Ideal Wing.

What one really needs then, in most cases, is a high speed wing, such as R.A.F.15, loaded up to give the required top speed at somewhere near the best L/D angle, and some means for changing that wing to a high lift wing for landing.

To some extent this is possible and has already been done. As a matter of fact, every modern aeroplane, with very few exceptions, is to some extent fitted with variable wings, for ailerons are nothing but a camber changing device, and actually serve to change the portion of the wings to which they are attached from high to low lift wings, or vice versa. For within certain limits the greater the camber of a wing, the greater its ultimate lifting capacity, and the higher the loading it can carry for a given landing speed. Pulling down an aileron effectively increases the camber of the wing whereof it forms part. This in itself would appreciably increase the lift. Actually it also increases the angle of incidence, because it lowers the trailing edge relatively to the leading edge. Thus the increased lift due to pulling down an aileron in normal circumstances is caused by two factors—one, the increased camber, and the other the increased incidence.

But, increasing the camber of a wing, although it increases the maximum lift of that wing, does not necessarily increase the angle of incidence of greatest lift, and above this angle the lift falls again. That is, increasing the camber does not increase the angle at which stalling occurs.

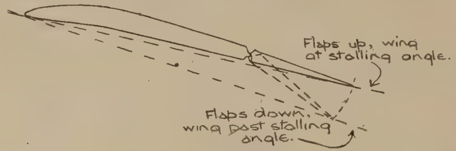

Flaps up, wing at stalling angle.
Flaps down, wing past stalling angle.

**Fig. 1.**

Hence it occurs that if a wing is already at its angle of maximum lift and one aileron is pulled down, that pulled down aileron may be at an angle of incidence above stalling point, and in the result a decrease of lift may occur (Fig. 1).

This is the explanation of the ineffectiveness of lateral controls when a machine is flying at or near stalling speed. It has also an important bearing on the use of variable camber wings, and to some extent explains the belief of certain pilots that variable camber gears are useless.

From what has been said as to ailerons, it will be obvious that if instead of the ailerons of a machine being arranged in the ordinary way they are arranged so that both ailerons may be pulled down, or up, together, the qualities of the wing will be so changed that, with the two flaps pulled down, a higher maximum lift, and hence for a given loading, a lower landing speed, can be reached. If, instead of merely using short flaps at the end of the wing one fits a flap along the whole wing, a very considerable change of this nature can be made.

### Early Tests on Variable Camber Wings.

So far as can be discovered the first practical tests of this type of variable camber wing were made at the Royal Aircraft Factory in 1913 or 1914. Tests were also made at the N.P.L. before the war on a wing fitted with flaps along its whole length.

These showed that by pulling down the flaps a steady increase in the maximum lift occurred up to an angle of flap of 20 degrees, the amount of this increase being in the neighbourhood of 35 per cent. The original wing section, with flaps straight, was of the low lift, high speed type.

In practice this meant that it was possible by using the flaps to carry a wing loading 35 per cent. greater than on the unaltered wing without increasing the landing speed, and with that increased loading one gained the advantage of the higher top speed which would result from the same increased loading on the unaltered wing.

Further, with the flaps down the L/D for the wing at coarse angles of incidence—those used in getting off and climbing—was improved. That is to say that the thrust needed for getting off and climbing was decreased and, therefore, for a given wing loading and a given weight per h.p., a quicker get-off and a better climb and ceiling can be obtained.

### The Practical Difficulties in Use.

In the real aeroplane, unfortunately, there are a certain number of practical difficulties in the way of the use of flaps for camber changing purposes.

Ailerons are not the only possible form of lateral control surface, but they possess a number of practical advantages over other arrangements and therefore some method of combining ailerons with the camber changing flaps is desirable. The simplest and most obvious method is to use ailerons at the wing ends in the ordinary way, with variable camber flaps inside the ailerons. Then for landing the flaps would be pulled down, the ailerons remaining in their normal position.

If a flexible connecting surface between the flap and the aileron can be devised, so that there is no sudden change in camber at the end of the flaps and the beginning of the aileron, this would in effect mean using a washed-out wing tip when the wing was acting as a high-lift wing. This should be, on the whole, an advantage, and if the arrangement can be made to give a smooth change of section when the flaps are at their maximum lift position there are reasons for believing that the maximum lift would be greater than if a full length flap were used or the ailerons were pulled down as well as the flaps.

But any arrangement leaving a large gap between the ailerons proper and the variable camber flaps would undoubtedly lead to serious losses both in the shape of reduced lift and of increased drag.

### Variable Camber Mechanisms.

The only alternative solution is a mechanism which will allow the flaps to be moved up or down as a whole, and at the same time allows the flaps on opposite wings to be moved in opposite directions to serve as ailerons. There are numerous methods by which this can be achieved.

In Fig. 2 is shown diagrammatically the connections of an ordinary pair of ailerons to a control stick. A, B is the top wire, coupling the ailerons—the balancing wire as it is often called—and C.E.D. the operating wire coupled to the "joy-stick" at E. Very little thought is needed to see that if the wire C.E.D. can be shortened, and the wire A.B. lengthened by equal amounts, both ailerons will be pulled down, but the "joy stick" will still control the ailerons in the ordinary way. In the case of the wire connected to the control, it is obvious that the shortening must occur equally on either side of the stick, otherwise the stick will be displaced from its normal position, i.e., it will not be central when the ailerons are level on the two sides.

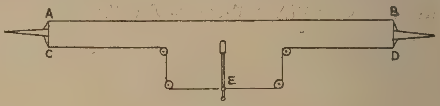


**Fig. 2.**

### An Example.

Fig. 3 shows one method of arranging the combined aileron and flap control. At the moment one cannot remember whether it is that designed by Mr. C. R. Fairey, and patented by him sometime in 1916, or whether it is another arrangement designed by the present writer at the same time and for the same purpose. Anyway, it will be wise to enquire at the Patent Office before using it—somebody is pretty certain to have protected it.

1, 2, 3 and 4 are fixed pulleys; 5 and 7 and 6 and 8 are pairs of pulleys, each pair carried by a nut on a right- and left-handed screw. This screw can be rotated by chain, cable, or other convenient means, from the pilot's seat. As the screw rotates the two pairs of pulleys obviously move in opposite directions.

The control cables from the upper flap levers A, B. pass over the pulleys 6, 1, 2, 5, in that order, going from A to B. If the screw is rotated so as to bring pulleys 5 and 6 closer together, it will be seen that the wire A.B. is slacked off, for pulley 6 comes closer both to A and to pulley 1, while pulley 5 approaches both B and pulley 2.

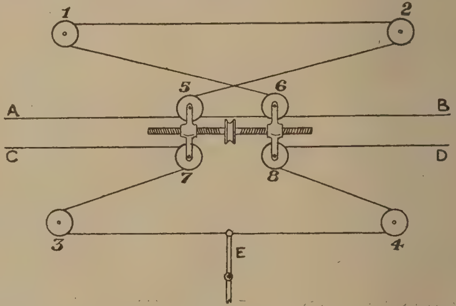


**Fig. 3.**

The lower control wires from C to D pass over pulleys 7, 3, 4 and 8, and as pulley 5 on the upper wire approaches B and pulley 2, pulley 7 on the lower wire recedes from C and pulley 3. The same happens in regard to pulley 8 on the other side. That is, the wire C.D. is tightened up while the wire A.B. is slacked off. Reference to Fig. 2 shows that this pulls both flaps down.

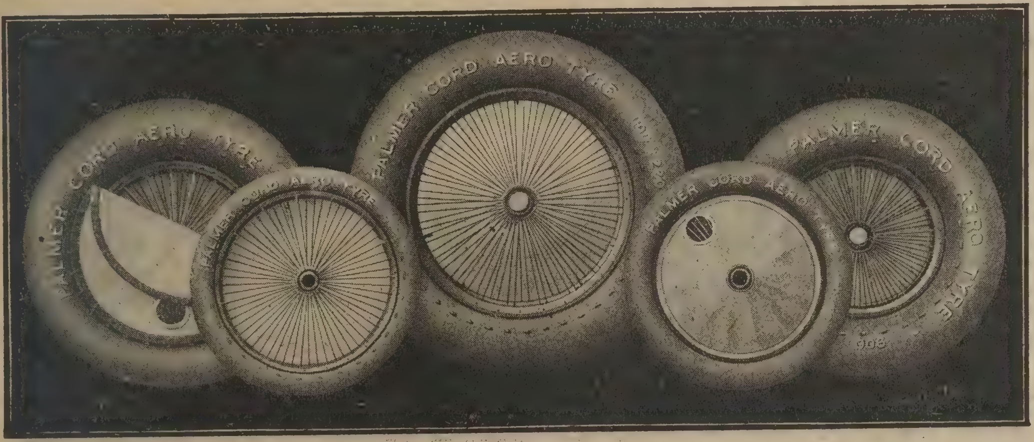
Wire C.D. is still coupled to the control lever at E between pulleys 3 and 4, and, as an equal amount of slack is given or taken up on each side of E by the mechanism, the lever remains central when the flaps are centred. Incidentally the artist has shown the control lever upside down, but this does not affect the argument.

### Aileron and Flap Combinations.

This arrangement as shown is directly applicable to cases

# PALMER

# LANDING WHEELS & TYRES



## STANDARD SIZES

| Tyre Size | Wheel No. | Hub | | Track Line |
|---|---|---|---|---|
| | | Length | Bore | |
| | | m/m | m/m | m/m |
| 300×60 | 16 | 111.12 | 25.4 | Central |
| ,, | 17 | 72.39 | 12.7 | Central |
| 450×60 | 30 | 89. | 31.75 | Central |
| ,, | 138 | 130. | 38.09 | Central |
| 575×60 | 21 | 160. | 28. | Central |
| ,, | 34 | 150. | 31.75 | 104/46 |
| ,, | 111 | 150. | 38.09 | 104/46 |
| 600×75 | 21 | 160. | 28. | Central |
| ,, | 34 | 150. | 31.75 | 104/46 |
| ,, | 111 | 150. | 38.09 | 104/46 |
| 700×75 | 78 | 178. | 44.45 | 132/46 |
| ,, | 79 | 178. | 44.45 | Central |
| ,, | 100 | 178. | 38.09 | 132/46 |
| ,, | 101 | 178. | 31.75 | 132/46 |
| 700×100 | 77 | 178. | 44.45 | 132/46 |
| ,, | 92 | 185. | 55. | 135/50 |
| ,, | 95 | 185. | 55. | Central |
| ,, | 96 | 178. | 55. | 132/46 |

| Tyre Size | Wheel No. | Hub | | Track Line |
|---|---|---|---|---|
| | | Length | Bore | |
| | | m/m | m/m | m/m |
| 700×100 | 99 | 178. | 38.89 | 132/46 |
| ,, | 112 | 150. | 38.09 | Central |
| 650×125 | 119 | 178. | 55. | 132/46 |
| 750×125 | 77 | 178. | 44.45 | 132/46 |
| ,, | 92 | 185. | 55. | 135/50 |
| ,, | 95 | 185. | 55. | Central |
| ,, | 96 | 178. | 55. | 132/46 |
| ,, | 99 | 178. | 38.89 | 132/46 |
| ,, | 112 | 150. | 38.09 | Central |
| 800×150 | 82 | 185. | 55. | 135/50 |
| ,, | 85 | 185. | 55. | Central |
| ,, | *36 | 185. | 55. | 135/50 |
| ,, | *40 | 185. | 60.32 | 135/50 |
| ,, | 152 | 185. | 66.67 | 135/50 |
| 1000×150 | 131 | 220. | 66.67 | Central |
| ,, | 102 | 185. | 55. | 125/60 |
| ,, | 141 | 250. | 80. | Central |
| ,, | 201 | 185. | 60.32 | 125/60 |

| Tyre Size | Wheel No. | Hub | | Track Line |
|---|---|---|---|---|
| | | Length | Bore | |
| | | m/m | m/m | m/m |
| 1000×150 | 209 | 185. | 55. | Central |
| ,, | 210 | 185. | 60.32 | Central |
| 1000×180 | 148 | 220. | 80. | Central |
| ,, | 149 | 185. | 55. | Central |
| ,, | 155 | 220. | 66.67 | Central |
| 900×200 | 107 | 185. | 55. | Central |
| ,, | 108 | 185. | 55. | 125/60 |
| ,, | 128 | 220. | 66.67 | Central |
| ,, | 137 | 250. | 80. | Central |
| ,, | 202 | 185. | 60.32 | Central |
| 1100×220 | 134 | 220. | 66.67 | Central |
| ,, | 136 | 250. | 80. | Central |
| 1250×250 | 133 | 250. | 80. | Central |
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where the whole of the flaps are used as ailerons, and this was actually done in some early machines fitted with flaps. The arrangement has the somewhat serious disadvantage of making a very heavy lateral control, because the inner sections of the flaps take just as much moving as do the outer sections, but they produce much less controlling effect, owing to the shorter radius at which they act.

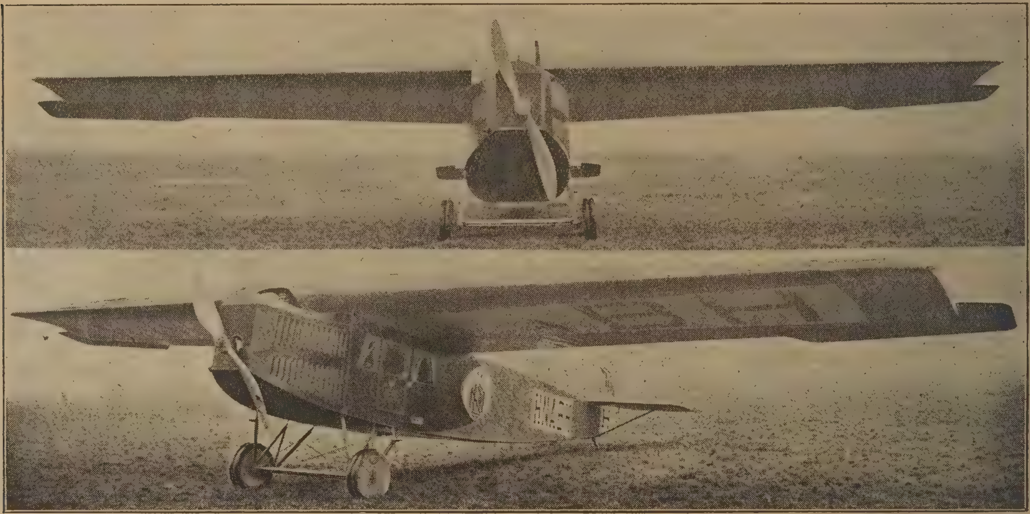
This difficulty is overcome by dividing the flaps into two sections, only the outermost being operated as ailerons. The mechanism for these ailerons can be exactly as in figure 3. A second exactly similar mechanism, except that the wire between pulleys 3 and 4 is fixed at E instead of being attached to a movable control column, will obviously serve to operate that part of the flaps not used as ailerons. But there is no need to duplicate the whole gear, for obviously all that is necessary is to provide two pulleys in place of each of those shown; for instance, each of the arms carried by the right and left screw will carry two pulleys side by side instead of one only. Then the flap wires pass round one set of pulleys and are fixed to the fuselage at a point corresponding to E. The aileron wires pass round the second set and are coupled to the control as shown.

Then rotating the R and L screw winds all the flaps up or down in unison, yet the outer sections are still free to act as ailerons in the ordinary way.

This is, in effect, the variable camber gear so largely used by the Fairey Aviation Company on their seaplanes.

*(To be continued.)*

## THE NEW FOKKER COMMERCIAL AEROPLANE—TYPE F.III.



**Two views of the Fokker F.III Commercial Monoplane (Siddeley "Puma" Engine). Note that balanced ailerons are fitted, although the drawing supplied by the makers does not show these. It will be noted that the engine is off-set to port.**

The N. V. Nederlandsche Vliegtuigenfabriek, Amsterdam, has produced for the season 1921 a new commercial machine, the construction of which is the result of the experiences gathered from practical use with the previous F types.

Mr. A. H. G. Fokker at once realised when the war came to an end the utter impossibility of successfully converting the existing war-machines into commercial aeroplanes. He recognised the absolute necessity of creating entirely new designs in order to meet the requirements of commercial aviation, viz., simplicity of construction, reliability, durability, economy in use, and facility of repairs, combined with the greatest possible comfort for the travelling public.

With this object in view the F types have been constructed and continually improved.

### General Description.

The F.III is a single engine monoplane with cantilever wing. The machine is built to carry five passengers, one pilot and five hours' fuel, a total load of 800 kg. The power plant with tractor screw is in front, and the pilot's cockpit is at one side of the engine. The commodious passengers' cabin is directly under and attached to the two main spars of the big wing. Behind the cabin the body tapers to a vertical knife edge, to which the tail-plane, elevator, and rudder are attached. With the exception of the wing, metal construction has been employed throughout. The fuselage, the power plant, landing gear, ailerons, and tail-plane are of welded steel tubing. The cowling consists of aluminium sheets, and the rear of the fuselage is covered with doped canvas.

### Details of Construction.

An entirely new feature in the design of this machine is the placing of the pilot's cockpit to one side of the engine. This, as is only natural, has caused a great deal of comment. Upon first thought a good many pilots have a certain dislike to sit by the side of the engine and to be placed so far forward in the machine. When carefully studying the entire construction, however, it soon becomes evident that this is an ideal location for the pilot's seat and affords the greatest possible protection in the event of a crash.

The strength of the entire structure is such that the probability of getting crushed is practically negligible. The danger of the motor being forced backward is much greater in machines built according to the old system. Also the possibility of displacement of the engine sideways is very small and presents no danger for the pilot That the aforesaid is correct has been proved by practical experience. The visibility is most excellent in all directions, much better in fact than in many other machines. This location of the pilot's cockpit has the following other advantages :—

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**Interior view of the Passenger Cabin of the Fokker F.III.**

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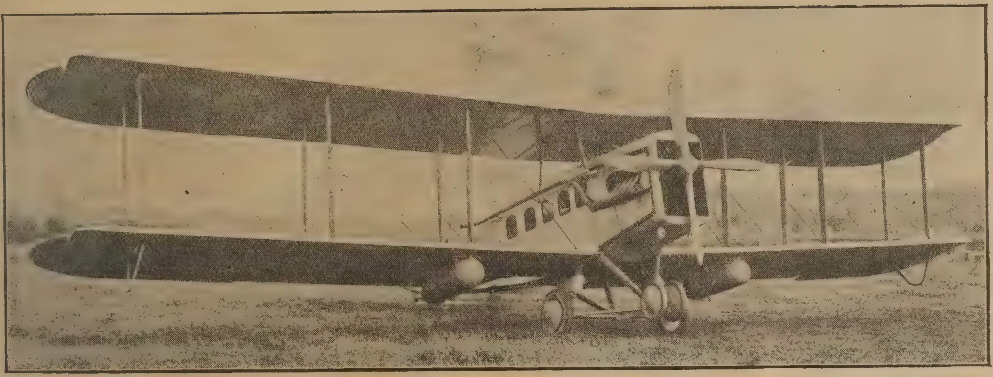

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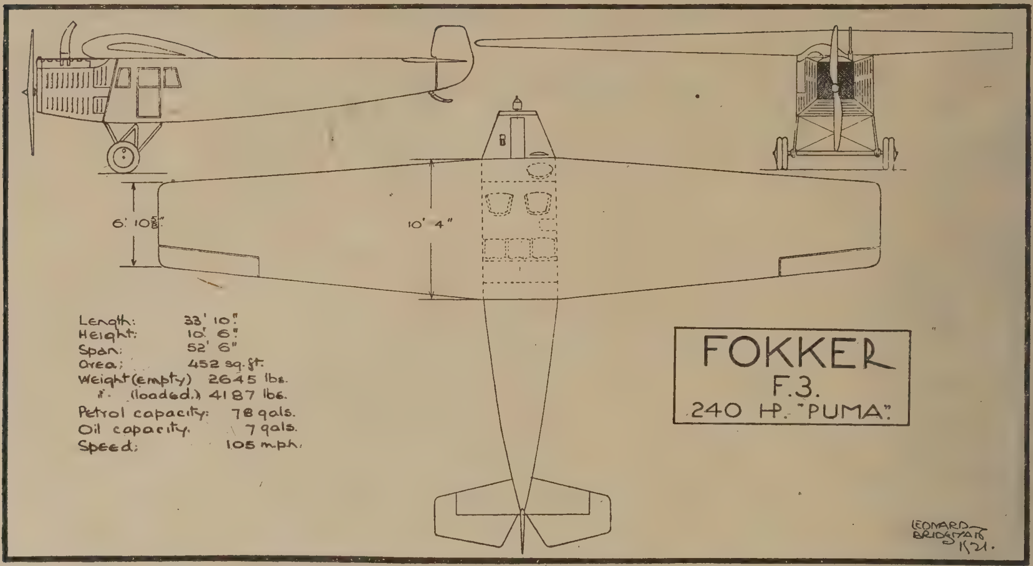


trols, which are extremely short, strong and simple, so that there is practically no chance of trouble.

Protection against the cold during long flights in cold weather. The temperature can be regulated by simply opening or closing the shutters provided for ventilation.

Complete absence of draught. A large wind-screen is fitted in front of the pilot, by which the air is conducted over the front edge of the wing, which is scooped out in the middle in order to obtain a better view upward. The instruments are fitted in the free space thus obtained inside the wing's edge.

### Controls.

The control gear consists of a lever and wheel, to which the controls of the elevator and ailerons are attached, the rudder controls are connected with two pedals. The control cables are led inside the fuselage and the wing, and run over large diameter pulleys.

### The Wing Structure.

The wing is the only part of the machine made entirely of wood. All metal wings, although employed in a good many experimental machines lately, cannot yet be considered sufficiently reliable to be used in an air service where the lives of the passengers are concerned. It will still require a good deal of experiment before metal wings can be generally adopted. In addition to this the initial cost of wooden wings is less, repair is easier and the necessary material can readily be procured in all parts of the globe.

The deep box sections of the main spars consist of spruce with three-ply sides. The ribs are of similar construction.

The covering also consists of three-ply wood and stiffens and completely braces the wing framing. The great thickness of the section renders a warping of the wing impossible and makes adjusting of any kind unnecessary. The surface is varnished and absolutely weatherproof For use in the Colonies the wood is subjected to a special treatment in order to protect it against the influence of tropical climates.

### Fuel System.

The petrol system has been constructed with the object of attaining the greatest possible safety against fire. Pressure-tanks and mechanically driven pumps with all their possibilities of trouble have been avoided by adopting the gravity system. The tank, of very solid construction, is fitted between the two main spars of the wing, which protects it on both sides. The feed pipe is very short and is fitted with only one cock, well within reach of the pilot, enabling him to stop the flow of petrol at any moment. As a result of the tubing being completely in view of the pilot, inspection during the flight is rendered possible

The petrol passes through a large filter so that all impurities are collected before it reaches the carburetter. A partition of aluminium sheet between the tank and the passenger cabin prevents petrol from getting inside the cabin in case of leakages. Accumulation of vapours between the tank and the cabin is rendered impossible by ventilation. Overflow pipes are fitted to the carburetters and conducted to the outside of the fuselage. The exhaust pipe is fitted well in front of the machine on that side of the engine opposite to the pilot's cockpit and conducts the exhaust direct into the open.

Petrol filling is also very simple and cheap. By means of a pump, fastened to the machine and provided with a flexible hose, a single man can fill the tank directly from a petrol tank without any waste of petrol or danger of explosion.

Very great care has been taken to simplify removal of the engine cowling and uncovering of the power plant for inspection or repair takes place in a couple of minutes.

### The Passenger Cabin.

The view from the closed passengers' cabin, which is luxuriously furnished, is splendid. The passengers are seated as comfortably as in a motor car, well protected from the weather, and ample means of ventilation are provided. There is sufficient room for small luggage behind the rear seats.

### Flying Qualities.

The easy and smooth flexibility of the flying properties, which equal those of a small scout, are most astonishing in such a big machine as the F.III. Cruising speed is about 160 km. per hour. Another advantage is the fact that with a little practice the machine may be forced-landed in a comparatively small field. The performance of the machine is remarkable, considering the comparative small engine power. The standard engine employed is the 230-h.p. Siddeley-Puma This type of machine can be fitted however with any 6-cylinder engine of normal dimensions from 185-230-h.p. and weighing about 350 kg.

### A Larger Version.

A similar machine, the F.IV, built to carry one pilot and 8-10 passengers, is fitted with engines varying from 360-500 h.p., such as the 360-h.p. Rolls-Royce, the 400-h.p. Liberty, and the 450-h.p. Napier Lion, giving a cruising speed of about 170 km. per hour. If a greater speed should be required or a greater number of passengers be carried the machine would be fitted with a 600-h.p. Packard.

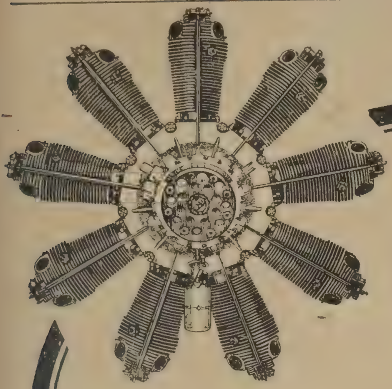
The factor of safety is considerably above the average of other commercial machines.

## THE RAILWAYS AND AIR RAIDS.

Railways and Air-Raids, Forming Part V. of "British Railways and the Great War," by Edwin A. Pratt. (8vo pp. 96, illustrated. London: Selwyn and Blount Ltd. 3s. 6d. net.)

The general public have little knowledge as to the organisation which was created in Great Britain as an answer to enemy aircraft attacks. A few hack journalists have written lurid accounts of impossible happenings, but there has as yet been no good general account of the anti-aircraft defences based on accurate military information

A section of the gap is filled by Part V of "British Railways and the Great War," which outlines the anti-aircraft work done by the railways. The information given is generally accurate, the style of composition is quiet. The author understands the value of each part of the defences in a manner which shows he has given careful attention to the subject. He explains correctly the real value of the "balloon aprons" which so successfully intrigued the public and alarmed the enemy.



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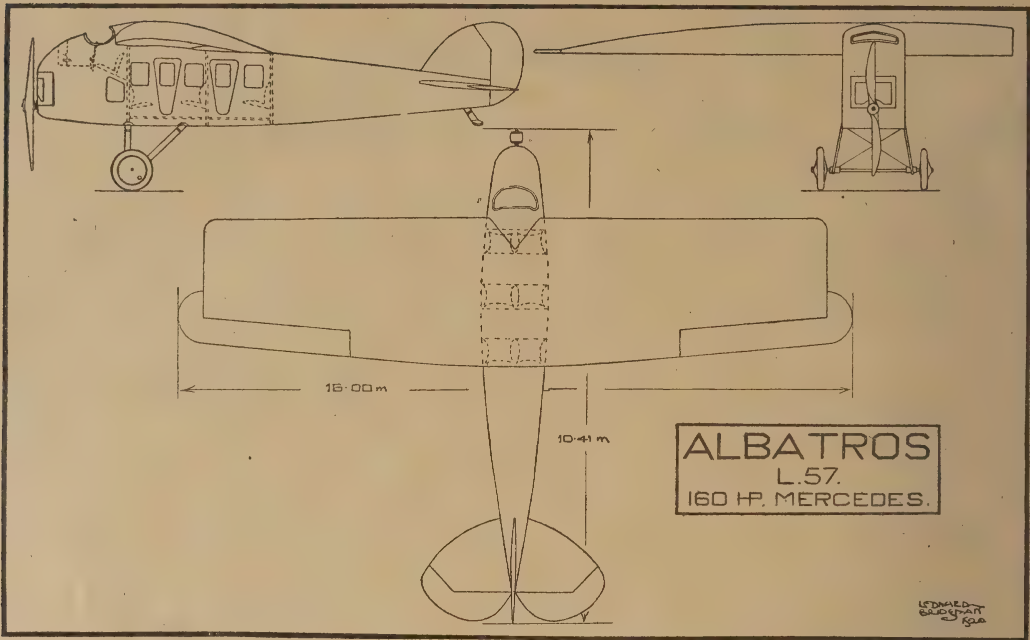
# A NEW ALBATROS MONOPLANE.



The drawings hereto attached show the Albatros, type L.57, an eight-seated cantilever monoplane designed during 1919-20 by Herr Schubert, of the Albatros Works at Johannisthal. The general lay-out resembles that of the now well-known Fokker passenger monoplane.

The fuselage is of great section and entirely contains the cabin accommodation. This is in two compartments, each with side entrance doors, and provides seats for six passengers. The fuselage itself is of three-ply box type.

The single-piece wing of cantilever type is also of plywood structure, and is carried from the top of the fuselage at four points. The central depth of this wing is 0.6 metres, and the central section is used as stowage for baggage, etc., and also to carry fuel tanks.

All control surfaces are balanced.

Either the 160-h.p. Mercédès, the 185-h.p. B.M.W., or the 300-h.p. Benz, type Bz IV, can be installed. The attached specification gives the main dimensions, etc.

SPECIFICATION OF THE ALBATROS L.57.

| | |
|---|---|
| Span | 16 m. |
| Length overall | 10.42 m. |
| Height overall | 3.55 m. |
| Weight empty, | 1,036-1,140 kg. |
| Load | 870 kg. |
| PERFORMANCE. | |
| With 160-h.p. Mercédès— | |
| Speed, sea-level, | 149 k.p.h. |
| Speed, 2,000 m. | 144 k.p.h. |
| Ceiling | 3,450 m. |
| Climb, 1,000 m., | 10.3 min. |
| Range | 500 km. |
| With 185-h.p. B.M.W.— | |
| Speed, sea-level, | 154 k.p.h. |
| Ceiling | 3,960 m. |
| Climb, 1,000 m., | 8.3 min. |
| With 300-h.p. Benz— | |
| Speed, sea-level, | 160 k.p.h. |
| Ceiling | 4,500 m. |
| Climb, 1,000 m., | 3.2 min. |
| Range | 475 km. |

* * *

## EXPERIMENTS WITH SUPERCHARGED ENGINES.

A very valuable paper was read before the Institution of Automobile Engineers on May 11th by Mr. Harry Ricardo on experiments carried out by him during the years 1915 and 1916 in connection with supercharging. In his introductory remarks he pointed out that the only two obvious ways of increasing the power output of an internal combustion engine were by increasing the mean pressure or the piston speed, and that the former was not hopeful seeing that the volumetric efficiency is already closely up to the highest obtainable, while the compression ratio has reached the highest safe limit for the fuels available. Further objections would accompany the increase in maximum pressure, as it would involve heavier moving parts and enhanced mechanical losses.

He also ruled out increase in piston speed owing to the difficulties involved in obtaining adequate valve area, and on the score of expense in manufacture. The supreme objection to any of these possibilities lay in the difficulty of dealing with the heat flow, which is already serious enough. He started on his experiments with the idea that the only hopeful solution of the problem of increasing the power and also the economy lay in the reduction of the maximum flame temperature. He then discussed the temperatures due to various mixture densities, showing the need for weak mixture in order to maintain low flame temperature.

The lecturer described some experiments in connection with weak mixture, and the possibility of obtaining weak mixtures capable of being ignited by means of stratification. The net result of experiments on an old-fashioned single cylinder engine indicated that it was possible to reduce the mean mixture strength down to as low as 10 B. Th. Us. per cu. ft. (compared to 90 B.T.Us. of a normal mixture), and yet obtain regular running.

Unfortunately, however, he found that similar results could not be obtained from other engines, and a new engine was accordingly designed embodying the information obtained from the previous experiments, but having a cross-head type of piston, the cross-head guide forming a scavenging and/or supercharging pump. The air pressure obtained in the cross-head chamber was about 12 lb. per sq. in., which raised the pressure of the cylinder contents to about 5 lb. per sq. in. above that of the atmosphere. Arrangements were made by which the supercharging air formed a layer above the piston and remained stratified from the combustible mixture above it.

The mean mixture density of the whole cylinder contents thus obtained was only about 66 B.T.U. per cu. ft., which, under ordinary conditions would not have been inflammable.

The first experiment showed that the brake h.p. and consumption were improved by about 5 per cent. when supercharging, and that the brake mean pressure rose from 106 lb. to 112 lb. per sq. in. with the same mixture strength. Difficulties in connection with detonation occurred when any attempt was made to enrich the mixture.

Tests were made which showed that detonation was not being caused by uncooled parts, such as sparking plug points. He then endeavoured to reduce the compression temperature by passing the air from the cross-head chamber through an intercooler, but this had no effect, though this intercooler was later found useful. Variations in the setting of the exhaust valve put the author on a new line of investigation, and experiments were made with the products of combustion admitted to the supercharging cylinder instead of pure air, and by this means the brake mean pressure was increased to 128 lb. per sq. in. without any detonation. It is this use of the products of combustion that forms the key to the situation, but the details should be studied in the paper.

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## THE THEORY OF AEROFOILS.

There has just been issued by the American National Advisory Committee for Aeronautics a translation of a note by Dr. A. Betz of the Göttingen Laboratory, which gives an elementary explanation of some part of the theory of aerofoils developed by German aerodynamical authorities, chiefly Dr. Prandtl.

This note (No. 41) deals with the effect of aspect ratio on the performance of an aerofoil, and gives certain formulæ whereby one may deduce the results which will be obtained by the use of an aerofoil of given aspect ratio if one knows the results obtained with a similar aerofoil of different aspect ratio. Very unfortunately the translation is in certain places so loose as to be misleading. This is possibly due to a too literal translation of German mathematical idioms.

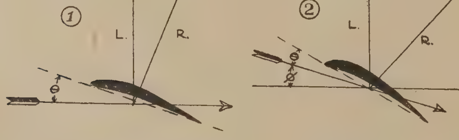
The elementary basis of the theory as here expounded is very simple, and is worth while outlining. Readers of this paper should be familiar with the idea that the lift of an aerofoil is due to the fact that air flowing past the aerofoil is deflected downwards, and therefore a downward force has been exerted on the air by the aerofoil. Conversely as action and reaction are always equal and opposite, an upward force of equal magnitude is exerted on the aerofoil by the air. The magnitude of this force is equal to the product of the mass of air deflected in each second, and the vertical velocity imparted to that air.

Now if an aerofoil of span S is moving through the air at velocity V in each second it acts on a lump of air of width S, of length V, and of some depth D. Actually in unlimited air the depth of air affected is also unlimited, but the vertical velocity imparted to the air grows less and less as the distance from the aerofoil is increased. It is, however, permissible to substitute for this unlimited depth of air affected an equivalent depth D which would account for the observed lift on the aerofoil if the downward deflection were uniform throughout that depth. Assuming such a depth it is possible to give a value to the downward velocity of the air stream to correspond to any experimentally determined value of lift.

Now immediately behind the aerofoil this downward velocity will have its full value. Some way ahead of the aerofoil the air is undisturbed and has no downward velocity, and at the aerofoil itself, even at its leading edge, there is a downward velocity whose value lies between O and the full value attained just aft of the aerofoil. That is to say that the aerofoil is itself working in a downwash due to its own influence.

It can be shown that this downwash velocity is less and less as the aspect ratio of the aerofoil concerned becomes greater, and finally, if the aspect ratio is infinite, the angle of downwash becomes zero. The smaller the aspect ratio the greater the angle of "downwash."

In the accompanying figure (1) an aerofoil is shown in a horizontal airstream at an angle of incidence $\theta$. The total air force is shown by R, and this force is resolved into L (lift) and D (drag). This corresponds to the aerofoil of infinite aspect ratio, in that the air stream is horizontal—i.e., there is no downwash.



**THE GOTTINGEN THEORY OF THE EFFECT OF ASPECT RATIO.—At 1 is shown an aerofoil of infinite aspect ratio in a horizontal wind. At 2 a wing of finite span is shown at an angle producing the same total force. This angle is greater, relatively, to the horizontal, by an angle $\varphi$ which represents a downward wash set up in the air stream by the aerofoil itself.**

In Fig. 2 there is a downwash at an angle $\phi$—that is the air stream is no longer horizontal. This corresponds to the case of a finite aspect ratio. The true angle of incidence remains $\theta$, but the apparent angle of incidence has become $\theta+\phi$. The resultant force R remains as in the original case, but it is rotated backwards through the angle $\phi$, and thus D (drag) is increased, and L (lift) decreased.

The angle of downwash $\phi$, according to this theory, is directly proportional to the lift coefficient developed, and inversely as the aspect artio, and the conversion of results of tests on wings of one aspect ratio to those appropriate to a greater or a less ratio is quite a simple process.

It is gathered that experiment has given a very fair comfirmation of this theory, which would seem to mark a distinct step forward in the elucidation of the habits of aerofoils.

## NOTES FROM ABROAD.

### AMERICA.

### The American 1,000-h.p. Engine.

As was briefly narrated in these columns some weeks back, the American Air Service Engineering Division at McCook Field is engaged in the design of an aero engine of 1,000 h.p. A certain amount of information as to this design has recently been published in the "Air Service News Letter."

The engine is to be of eighteen cylinders (presumably three rows of six each), each cylinder 6½ in. bore by 7½ stroke, to develop 1,000 h.p. at 1,400 r.p.m. The cylinders are of steel with steel welded on water-jackets, each with four valves in the head. Four spark plugs are to be fitted to each cylinder and four separate and independent 18-cylinder magnetos are to be fitted.

The engine is arranged for a direct airscrew drive, no reduction gear being fitted. 1,400 r.p.m. seems rather a high speed for an airscrew on an engine of this output, so that presumably the engine is destined for machines developing a high speed of flight.

A single cylinder unit of the proposed type has received fairly extensive tests with satisfactory results, and the authorities are satisfied that the proposed engine will develop its rated h.p. on a very low fuel consumption, and that the design will secure reliability and a low weight per h.p.

### A Reversible Steel Airscrew.

The American Air Service has recently tested, at McCook Field, the reversible steel airscrew manufactured by the Standard Steel Propeller Company of Pittsburg. It is stated that in tests this type of airscrew has shown its capacity to bring a machine to a standstill within a few feet after touching the ground, thus making it possible to land in very confined spaces.

The blades of this airscrew are made from solid drawn steel tube, tapered in section and thickness from root to tip and without welds except that used for closing the tips. The roots of the blades are circular and are carried in a separate steel boss on rollers and ball bearings. No details are available as to the reversing and pitch adjusting mechanism, except that a quick reverse lever and a fine adjustment handwheel are fitted as controls.

The design of the blades is due to the McCook Field staff, the mechanical details of the gear to the Standard Steel Propeller Company.

There can be little doubt that a reversible airscrew would form a most effective brake for landing in small fields. The unfortunate fact is that usually it is most often necessary to land in small fields when one's engine refuses to take one on to a larger one. It is, however, true that an engine with which it is no longer safe to fly may have sufficient kick to pull one up on the ground, and also there are many occasions when it would be convenient to land in a small space quite apart from being forced to by engine failure.

Unfortunately the reversible airscrew will not help one to get out of a small field, and the size of field one can use is often dictated by the question of getting out rather than that of getting in.

### An Aero-Photographic Appointment.

The Fairchild Aerial Camera Corporation has recently secured the services of Mr. E. R. Morton as technical and research engineer.

Mr. Morton was formerly retained by the Science and Research Department of the United States Air Service at the Bureau of Standards, Washington, D.C., and Langley Field. He is given credit for developing the technique of testing camera mounts and for extensive experimental work leading to the scientific design of aircraft camera mountings. The mounts for the Deram and K cameras were the immediate results of his work and when tested at Langley Field gave the practical proof of the soundness of his ideas.

Mr. Fairchild and Mr. Morton have already co-operated on the design of both oblique and vertical mounts which will make it possible for inexperienced aerial photographers to secure perfectly sharp aerial views free from vibration.

### JAPAN.

### Akabane Aeroplane Works Close.

A correspondent of THE AEROPLANE in Japan writes :—

The Akabane Aeroplane Works, conducted by Dr. Kishi, owing to the general business depression has been forced to close. The works, which was established five years ago, and at this time the works was well off, enjoying a good reputation. When it closed it had a liability of 150,000 yen.

The works recently had an order from the Japanese army for 20 machines, and at the time the plant closed three of them had been built.—N. K.

(*Continued from page* 456.)

started for Paris but discontinued the flight owing to mechanical trouble, near Rouen, the passengers proceeding by train. One learns that the machine will need a "piccolo riparrazione." Mr. Chattaway returned in the "Vimy" the following day.

On hearing of the mishap Mr. Barnard and staff worked all night on the "Vimy" to have her ready to start on the special Saturday Whitsun trip. She was ready by 10.00 o'clock and Mr. Barnard took her for a test. The weather being thick at Lympne the start was delayed. But soon after lunch Mr. Barnard got away with a full load and reached Paris in good time. Restarting with a full load again he returned to Croydon in the evening; a very satisfactory performance, which was repeated the following day by Mr. Powell on D.H.18 G-EARO. Mr. Powell made one of the best landings one has seen on an "18" coming in very low past Mr. Leverton's house (which always causes much joy to Mr. Leverton junior) and pulled up after a run of only a few yards.

By the time these lines appear the new "18" from the De Havilland Aircraft Company should have arrived at Croydon.

On Monday of this week Mr. Powell on the "18" made the Paris trip with a full load.

### The Flying Dutchmen.

The Fokkers are now getting a goodly number of passengers and usually carry a fair load of goods and newspapers. On Friday Mr. Hofstra, a Dutch pilot, who was coming from Amsterdam, never arrived and was reported missing. Considerable anxiety was felt until the news arrived that he had landed on the shore at Calais. He arrived at Croydon on Sunday evening, having stayed a couple of nights in France, during which time he said that he had learnt French. This is not surprising, because after a couple of nights in England he speaks and understands English, which he could not do when he first arrived.

Mr. Duke was unable to get away to time on Saturday morning owing to the fog in the Channel, but made an attempt about lunch time. On reaching the coast he found the Amsterdam route impossible, so returned to Croydon. He had as passengers two thoroughly sporting Dutchmen, one of them being Mr. A. G. Boissevain, a well-known Amsterdam newspaper owner. Mr. Leverton offered to send them on that night by rail and boat, but they would not hear of it, and quite understood the pilot's prudence in not trying to force the bad weather.

On Sunday Mr. Duke set off again with his two passengers and crossed the Channel in fog, but on reaching Dunkirk he again found further progress impossible so they again returned. On reaching Penshurst the weather was so bad that Mr. Duke had to land. The aerodrome was covered with sheep, but the two usual shepherds had taken a day off and Mr. Duke had great difficulty in landing. One learns that during the descent "our airman-composer" produced a little chant to the effect that the shepherds should watch their flocks by day as well as night.

They arrived back at Croydon about 16.30 and the passengers still sportingly decided to try their luck the following day. On the next attempt they succeeded in reaching Amsterdam.

### The Surrey Flying Services.

On Friday Messrs. Muir and Grant returned from Coventry on the repaired Avro. On Saturday Mr. Muir was stunting and carrying passengers in splendid weather and even in the rain on Sunday he had quite a number.

Monday was a beautiful day and Mr. Tebbit was flying the second machine. Between them they carried large numbers of passengers who were given either ordinary flights or loops and spins, etc.

Certain interesting developments may shortly be expected in connection with the Surrey Flying Services.

### The Leatherhead Aviation Services.

The Avro was going strong during the week end. Mr. Hayns' landings are now quite up to the style of Avro landings to which the habitués of Croydon are used.

On Whit Monday Mr. Hayns flew to Paignton to fetch Lord Uffington. He landed on a cricket field in the town; the players seeing that he wished to land drew stumps and gave him a clear field. He took off again shortly after with his passenger, and, after landing at deserted Beaulieu for a cigarette, he completed the journey to Croydon in 2¼ hours.

G. D.

## Coventry.

### Our Quaint Old Customs.

Mr. A. J. Cobham, the well-known aviator, formerly with the Berkshire Aviation Co., was fined five pounds and five guineas costs at Coventry on May 11th for flying an aeroplane over that city at an altitude lower than would have enabled him to land outside the city should his engine have failed. His machine was D.H.9 G-EAVK.

Mr. Cobham was taking photographs at the time and pleaded that there was no trick or stunt flying. Also he said that he could have got down with safety to the public from any position in which he was at any time. The evidence of, presumably inexpert, witnesses said that he was at one time level with the top of one of the much advertised "three spires" which itself was alleged to be 250 feet in height.

Mr. Cobham's reputation as a safe and careful pilot is so high that personally one would be prepared to accept his judgment against any other evidence, expert or otherwise. Still, a place like Coventry must of course maintain its quaint old customs, the chief of which is that of being averse to progress and reform. Hence Lady Godiva.

## Hendon.

One understands that there has been some flying during the week end at an enclosure in North London which calls itself "The London Aerodrome," and is near a village called The Hyde. It will be remembered that before the war a considerable amount of flying was done there. It is said that some privately owned Avros took up some passengers.—G. D.

# THE BRITISH DOMINIONS BEYOND THE SEAS.

## AUSTRALIA.

### Civil Flying Officials.

*Sea, Land and Air* states that under the Controller of Civil Aviation (Lieut.-Col. Brinsmead) the following appointments have been made:—Superintendent of Aircraft, Capt. F. W. Follett; Superintendent of Aerodromes, Capt. E. C. Johnson, D.F.C.; and Superintendent of Flying Operations, Capt. E. M. Jones, M.C.

## NEW ZEALAND.

### Aerial Activity in South Island.

The past few months have been marked by remarkable aerial activity in South Island. This, of course, is due to the New Zealand Aero Transport Company coming on to the field, and competition between the men from Washdyke and the pilots of the Canterbury Aviation Company has been very keen. Both companies sent machines to Dunedin and here they carried out numerous "joy-rides" and cross-country trips. The Aero Transport Company sent a 100-h.p. Avro and a 240-h.p. de Havilland to Dunedin, under Captains P. K. Fowler and M. Buckley, while the Canterbury Company sent a 110-h.p. Avro down. Captain Gray, who was the Canterbury pilot, was unfortunate with his machine. In landing in a paddock after a cross-country trip his machine collided with a steer and was damaged fairly seriously. However, another Avro was dispatched from Sockburn, and within a couple of days the Canterbury pilot was again carrying out passenger flights.

### The New Zealand Aero Transport Co.

The New Zealand Aero Transport Company has only recently been formed and has its aerodrome at Washdyke, close to Timaru. The company has six aeroplanes—three Avros and three de Havillands. The de Havillands are probably the largest machines flying in the Dominion. The company intends to erect hangars at Dunedin and Invercargill, and when these are erected two machines will be stationed at each hangar and a weekly service will be inaugurated between the three towns. As time goes on and should the service prove successful it will be extended to cover a wider area. The company has already made arrangements with the Postal Authorities to transport mails should the trains on the main North line ever be held up through a slip or washout.

### A Flight to Stewart Island.

On Jan. 13th the most southerly aeroplane flight in the world was made by Captain M. Buckley in one of the de Havilland machines belonging to the Aero Transport Company. Carrying two passengers the machine left Invercargill at 7 a.m. and a few minutes later the 'plane was circling over Stewart Island. The de Havilland returned to Invercargill at 7.30. During the trip a likely landing ground on Stewart Island was selected and this site will be surveyed later.

### Aerial Mail Services Started.

Aerial mails in New Zealand have been inaugurated at last. The Government has decided to give them a fair trial and it will depend on the success of these trials whether regular services will be maintained. The selection of the routes over which the trials will be made has not been very good; for between the various towns there is already a swift mail delivery by train.

On Jan. 31st the first air mail service was inaugurated in the South Island. The conditions were by no means ideal.

A South-Westerly gale, blowing at about 30 miles an hour, and frequent rain squalls were met with during the trip. Captain Euan Dickson left Sockburn at 8 a.m. in an Avro machine belonging to the Canterbury Aviation Company, and in the face of the strong gale. Flying at a height of between 500 and 1,000 feet, the 'plane maintained an average speed of between 60 and 75 miles an hour. Ashburton was reached at 9 o'clock, and a bag of mails left there and a fresh one taken on. Shortly after leaving Ashburton fine sunshine was encountered, the rain but not the wind being left behind. The aeroplane was ten minutes late in arriving at Timaru. The return trip of about 90 miles occupied just 65 minutes, the wind now proving a help instead of a hindrance, and the aeroplane landed at Sockburn some ten minutes before schedule.

The number of letters carried from Christchurch to Timaru totalled 178 (166 ordinary and 12 special delivery), and the number carried from Timaru to Christchurch was 113 (85 ordinary and 28 special delivery). Thirty letters were taken from Ashburton to Timaru and 72 from Ashburton to Christchurch.

Since the first few days the number of letters carried by the air mails has fallen off considerably. Each letter is charged 6d. for four ounces, with an additional charge of 6d. if the letter is to be delivered immediately on arrival by special messenger. Passengers are also carried, but there are not many offering. The rates charged are: Christchurch to Ashburton, £2 10s. single, £5 return; Ashburton to Timaru, £2 10s. single, £5 return; Christchurch to Timaru, £5 single, £9 return.

Messrs. Walsh Bros. (Auckland) are shortly expecting a Supermarine flying boat, and when this machine arrives it is expected they will commence a service between Auckland, Gisborne and Napier. Both this service and the South Island one will be daily services.—H. B.

## SOUTH AFRICA.

### The First Real Mail Service.

Recently, owing to a five days' continuous downpour of rain, the inhabitants of Kokstad were put to great inconvenience owing to the failure of all means of transport to deliver their mails from the railhead at Franklin.

Capt. Douglas Mail, of the Natal Aviation Syndicate, volunteered his services, and with his D.H.6 did the double journey between Kokstad and Franklin, in the rain, in twenty minutes, whereas the previous mail that had arrived from Franklin took over seventeen hours to get to its destination.

This is believed, by the *Motor Weekly* of Bloemfontein, to be the first time that the South African Government mails, in bags, have been carried as a complete mail, and they were carried when all other means of locomotion had failed

It is to be hoped that this demonstration by a machine unsuited for regular mail-carrying will sufficiently impress both the S.A. Government and the public with the great possibilities of commercial aviation in a country possessing such enormous tracts of land so badly fed by railways.

Incidentally the Natal Aviation Syndicate, which has been in operation nearly twelve months, has done much useful pioneer work in South Africa. During the period of its existance it has covered a large amount of country, chiefly in Natal, Transvaal and the Free State, without the slightest damage to any of its passengers. Capt. Mail, the chief pilot, on his last tour in the Transvaal, lasting four weeks, covered over 3,000 miles in getting from one place to another. This does not include the distance flown in carrying passengers at the numerous places at which he gave passenger flights, and during the whole of his tour he did not have occasion to touch either his engine or his D.H.6. The same machine is still in use with which the Syndicate started, although its previous military life is only supposed to have been a very short and sweet one.

### A High Flight.

A particularly fine flight was made by Major Honnett on March 24th, when in flying to Maclear he crossed the Drakensberg range at a height of 15,500 ft. on a 110-h.p. Le Rhone Avro with two passengers and luggage.

This appears to be a commercial height record for South Africa, and that it was done on a fully loaded three-seater Avro, reflects considerable credit on both the machine and the pilot.

### Commercial Aerial Photography.

Messrs. Frank and Shirley Solomon of Aviation Ltd. have recently turned their attention to aerial photography, as a supplement to their ordinary passenger carrying work, and aided by Mr. H. Goldstone, a professional aerial photographer, have made a series of views of Cape Town and Muizenberg, where their aerodrome is situated. Muizenberg is the premier health resort of South Africa.

With a view to making a commercial success of the venture a series of postcards were made of aerial views of the Cape Town district, but owing to the apathy of the general public (a state of affairs in which Cape Town can claim no originality) and after several weeks' hard work, it was decided not to continue further with the idea. The Solomon Brothers are continuing with aerial survey work, and are doing very well. In addition, they have had a successful season at their aerodrome at Muizenberg, having carried a considerable number of passengers on their D.H.6, which, in spite of the hard work, steadfastly refuses to "ca' canny," and is still in first-class condition—an excellent tribute to the pilots, mechanics and the British workmanship.

# FOREIGN INTELLIGENCE.

## BELGIUM.

### A Balloon Casualty.

Whilst making a training flight, in preparation for the Gordon-Bennett balloon race, M. Vleminck, a Belgian balloonist, was driven down in France by a high wind and dashed against some rocks, sustaining a broken arm and two broken ribs.

### Air Mail Cheapened.

The cost for sending letters or other postal matter by air from Belgium to London and Paris, is now reduced to 50 centimes per 20 grammes. The same tariff—which is exactly half of the prices quoted last year—will also apply to the new services from Belgium to Strasburg, Prague, Toulouse and Morocco.—R. V. Q.

## THE BELGIAN CONGO.

### A New Air Line.

In a lecture delivered in February before La Société Belge des Ingenieurs et des Industriels, by Colonel Van Crombrugge, Director of Aeronautics in the Ministry of War, it was stated that the Forminiere Company which operated diamond mines at Djoko-Punda, in Kasia Province, has asked that an air service may be opened between Kinshasa (the terminal of the Kinshasa and Stanleyville Air Line) and the mines. The distance between the two points is 500 miles, and can be covered in two days by aeroplane, as against from 35 to 40 days by boat. As the company have offered to pay the greater part of the initial cost the service should be opened in the immediate future.

### The Survey of the River Congo.

An aerial photographic survey of the River Congo is to be made and it is expected that complete charts based on the photographs taken will be issued within the next three years. The former methods of survey would take at least ten years to do the same work.

## FRANCE.

### Paris-Warsaw Air Line.

On April 12th the Paris-Strasbourg-Prague service of the Compagnie Franco-Roumaine was extended to Warsaw. The first machine to run on this service, which is now bi-weekly, left Warsaw at 08.00 o'clock with one passenger, baggage and mails, and on arrival at Prague a second passenger and additional mail was picked up. Le Bourget was reached at 18.30 o'clock, the distance of 875 miles having been accomplished in 10½ hours, as against the minimum of 60 hours required for the train journey.

### Developments for 1921.

The discussion of the French Budget for 1921 in the Senate on April 2nd was devoted principally to the future of French aviation. The items for the Flying Services were voted without modification.

General Hirschauer, an early Director of French Aeronautics, replied to critics who complained of the lack of progress and of co-ordination between the civil and military branches.

The Under Secretary of State for Aeronautics explained the Government's programme for the development of the Continental services. The connection with London and Brussels would shortly be augmented by a Paris-Amsterdam service, and the Paris-Prague line would be continued to Warsaw, in addition to which it was proposed to open up new lines across the Mediterranean and to the Near East.

France, he added, was ahead of other countries and her technical efforts were being vigorously pursued.

### More Encouragement.

It has been reported that the Aero Club de France has decided to award annually a special medallion to a certain number of air travellers who have the greatest air mileage for the year, professional aviators being excluded.

# *AIRCRAFT IN PARLIAMENT*

## HOUSE OF COMMONS.

Replying to Lieut.-Comm. KENWORTHY on May 3rd, Capt. GUEST said that there were 1,071 R.A.F. Reservists at Eastchurch, including 24 warrant officers and 456 N.C.Os. There were no Reservist officers. These were estimated to cost £4,000 per week. They were doing only the normal duties of the station. On the invitation of the Officer Commanding individual airmen had made representations concerning the loss and hardship they were experiencing. The decision to release them rested with the Cabinet.

On May 5th, Capt. GUEST, replying to Capt. WEDGWOOD BENN, said that experiments with helicopters were reported from Austria, Denmark, France, Spain and the United States of America. The Air Ministry had given and continued to give careful attention to those problems.

# THE ROYAL AERONAUTICAL SOCIETY.

## WEEKLY NOTICES.

*Finance Committee.*—The following gentlemen have been invited to serve on the Finance Committee for 1921-22: Sir Mackenzie Chalmers, Lord Cowdray, Mr. J. B. Maclean, Major-General Sir R. M. Ruck, Mr. A. E. Turner (Hon. Treasurer), and Mr. F. P. Walsh.

*Safety and Economy Committee.*—The next meeting of the Safety and Economy Committee will be held in the Society's offices on Friday next, May 6th, at 2.30 p m.

*Aeronautical Journal.*—The May number of the *Aeronautical Journal* is now available to non-members at 2s. 6d. a copy, and contains the following papers:—"The Use of Meteorology to Aviation and Vice-Versa," by Major G. Dobson; "Ground Engineering," by Wing Comdr. H. W. S. Outram; and "The Technique of Flight," Part 1, by Major R. M. Hill.

*Library.*—The following books have been received and placed in the Library:—"A History of Aeronautics," by E. C. Vivian; and "The Dynamics of the Airplane," by K. P. Williams

W. Lockwood Marsh, Secretary.

# THE ROYAL AIR FORCE MEMORIAL FUND.

A meeting of the Executive Committee of the above Fund was held at the offices of the Fund, 7, Iddesleigh House, Caxton Street, S.W.1, on April 14th, Lord Hugh Cecil in the Chair. The members of the Committee present were:—Lady Leighton, Dame Helen Gwynne-Vaughan; Mrs. Barrington Kennett, Sir Charles McLeod, Air Vice Marshal A. V. Vyvyan, H. E. Perrin, Esq., W. S. Field, Esq.

The list of donations received since the last meeting on March 10th showed the sum of £1,005 1s. 1d. as having been raised.

The amount of Grants made since the same date amounted to the sum of £104 14s. 1d., in addition to which the Officers Association have been reimbursed by a considerable Grant in aid of assistance given by that Association, on behalf of this Fund, to ex-officers, R.A.F., and their dependents.

The constitution of a newly appointed sub-committee to deal with cases of appeal from the rank and file, and widows and orphans was reported to consist of the following:—Mr. H. E Perrin (Chairman); Mr. W. S. Field, Mrs. L. M. K. Pratt-Barlow, Wing Commander Sidney Smith, D.S.O.

This sub-committee meets fortnightly and assists the Secretary in making grants in cases where he has not found himself able to dispose of the case by a small grant in the meantime.

The Committee approved of the purchase of a Presentation at the Royal School for Daughters of Officers of the Army, Bath. The Presentation costing £240, in addition to which £20 per annum will be paid in fees, and extras up to £7 10s. per annum. The child selected must be the daughter of an Officer of the Air Force who has held previous commissioned rank in the Army or Royal Marines. It is hoped to place a suitable candidate at the School in the Autumn of 1922.

The matter of the concrete Memorial to the fallen of the Royal Air Force was discussed at length, and is making material progress.

The Secretary reported that Messrs. Hampton and Sons had found themselves able to dispose of "Heath End," Ascot, for the sum of £6,000.

The second list of subscriptions and donations to the Fund will be published in a few days' time in the newspapers, and will embrace the period from July 21st, 1920, to March 31st, 1921.

# THE ROYAL AIR FORCE NURSING SERVICE.

The Air Ministry announced on April 13th:—

Regulations regarding conditions of service in the Royal Air Force Nursing Service, which was established by Royal Warrant on January 27th, 1921, have been issued.

The Service consists of a Matron-in-Chief, Matrons, Senior Sisters, Sisters and Staff Nurses. Candidates are required to join as Staff Nurses, and appointments, which are subject to a satisfactory probationary period of six months, are given to approved persons of British parentage, over 25 and under 35 years of age, who possess a certificate of training for at least three years at a large Civil hospital in the United Kingdom

The salaries of the various grades are as follows:-

Staff Nurses, £60 per annum, rising by annual increments of £2 10s. to £65
Sisters, £75 per annum, rising by annual increments of £5 to £85
Senior Sisters, £85 per annum, rising by annual increments of £10 to £95.
Matrons, £115 per annum, rising by annual increments of £10 to £185.

In addition, charge pay, not exceeding £45 per annum, is granted to Matrons according to the magnitude of their charges, and a weekly allowance of 24s. 6d. to all members in lieu of board and washing. Furnished quarters, fuel, light and attendance are normally provided, but where this is not the case an allowance in lieu is granted.

An initial grant of £20 is made towards the cost of purchase of the prescribed uniform which members are required always to wear when on duty, and when attending official or public entertainments, and an upkeep allowance of £5 for the second year and £10 for the third and subsequent years.

Members of the Royal Air Force Nursing Service may retire at the age of 50 or after 20 years' service, and retirement is compulsory at the age of 55. Retired pay, based on service and rank, is issued up to the following maximum rates, which are subject to revision in five years' time:—Matrons, £170; Sisters, £75; Staff Nurses, £55.

Members employed in the Royal Air Force Temporary Nursing Service and previously employed in the Navy or Army Nursing Service may count the period of such service towards retired pay.

A Nurse with less than ten years' service will not be eligible for retired pay, but provision is made for the issue, under certain conditions, of reitred pay and gratuities in the event of such service being terminated owing to disablement, sickness or unfitness.

Full particulars of the Service and forms of application for appointment may be obtained from the Matron-in-Chief, Air Ministry, Kingsway, London, W.C.2.

# PERSONAL NOTICES.

**[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of The Aeroplane There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]**

### Deaths.

CLARKE.—On April 14th, at Bilbeis, Egypt, the result of an air collision, Flight Lieut. George Malcolm Clarke, A.F.C., Royal Air Force, late Leinster Regiment, youngest son of Mr. and Mrs. George Clarke, formerly of West Kensington, aged 26.

COOPER.—On May 12th, at Brooklands, as the result of a motor-car accident, Captain J H. Cooper, late R.F.C., of Culland Hall, Bradford, Derbyshire.

COULSON.—On April 30th, at Oxford, Charles S. L. Coulson, D.F.C., late R.A.F.

DEANE.—Flying Officer Bernard F. Deane was killed on April 15th as the result of an accident caused by engine failure while flying from Andover to Old Sarum. Mr. Deane was born in China in 1896. He joined the R.A.F. from the Royal Sussex Regiment in April, 1918, as an Observer, and only recently qualified for his wings. He was married in March, 1920.

GREY.—On May 15th, in a London nursing home, Major Robin Grey, D.S.O., Grenadier Guards and R.F.C. and R.A.F. Major Grey, who went to France with No. 3 Squadron at the outbreak of war and was captured later, was one of the British prisoners of war selected by the German High Command for retaliatory punishment. After his release four years later he commanded the Royal Air Force at Archangel.

JONES.—On April 14th, at Cairo, killed in a flying collision in the air, Edward Blake Jones, R.A.F., only son of John Edward Jones, J.P., of Eastcliffe, Woodbery, S. Devon.

### Births.

COOKE.—On May 9th, at Blackfield, Fawley, Hants, to Rita (nee Chowne), the wife of Squadron-Leader G. G. H. Cooke, R.A.F.—a daughter.

EVANS.—On April 22nd, 1921, at 70, Lonsdale Road, Oxford, the wife of Flight Lieut. T. H. Evans, R.A.F., of a son.

HALLIDAY.—On March 29th, at 40, Kidbrook Park Road, Blackheath, to Kathleen, the wife of Christopher G. Halliday, R.A.F.—a daughter.

PETTER.—On April 17th, at Harcourts, Chertsey, the wife of R. C. Petter, late R.N.A.S., 9, Homefield Road, Wimbledon—a son.

PORTER, On April 28th, at 22, Strand Street, Ramsay, Isle of Man, Elizabeth Alice (Lillie), the wife of Flying Officer F. Porter, R.A.F., a daughter.

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## INDEX TO ADVERTISERS

| | |
|---|---|
| Accles & Pollock, Ltd. | 467 |
| Aircraft Disposal Co., Ltd., The | 465 |
| Armstrong Siddeley Motors, Ltd. | 467 |
| Arrol-Johnston, Ltd. | *Front Cover* |
| Auster, Ltd. | *Front Cover* |
| Beardmore Aero Engines, Ltd., The | *Front Cover* |
| Bristol Aeroplane Co., Ltd. | 465 |
| Cellon, Ltd. | 471 |
| Cunard Line | 472 |
| De Havilland Aircraft Co., Ltd., The | 458 |
| Fairey Aviation Co., Ltd., The | 457 |
| Hancock, James Lyne, Ltd. | 472 |
| Metal Airscrew Co., Ltd. | *Front Cover* |
| New Pegamoid, Ltd. | 472 |
| Nieuport and General Aircraft Co., Ltd. | 458 |
| Palmer Tyre, Ltd. | 461 |
| Roe, A. V., & Co., Ltd. | *Inside Front Cover* |
| Short Bros., Ltd. | *Back Cover* |
| Titanine, Ltd. | *Front Cover & Inside Back Cover* |
| Westland Aircraft Works | 463 |
| Wireless Press, Ltd. | 467 |

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## ON THE JAPANESE-AMERICAN WAR—II.

### Japan's Preparations for War.

It is already fairly well known that Japan is preparing for war on the grand scale. A very large proportion of the Japanese Army was put through its baptism of fire in relays at Tsing-Tao, the German base in China. Since then still further forces have been in action in one way or another against Bolsheviks and various quaint factions in Siberia. These men have all become accustomed to living under campaign conditions and form a very considerable field army.

Most people who have troubled to think about the subject at all imagine that there are perhaps 15,000 or 20,000 Japanese troops in Siberia. Military opinion in England has it that there are between 150,000 and 200,000 of them. But an Englishman who returned from Japan comparatively recently states that in Japan the number is supposed to be nearer 500,000. This last figure may be too high, but in view of the Japanese method of sending troops on active service in batches it is probably true that half a million troops have in fact already "gone through the mill" in Siberia.

At this rate the Japanese will have no difficulty in raising a couple of million field-trained troops by 1924. And by that time they may have an Air Service to match their Army.

The training of the Japanese military aviators is largely in the hands of the French, their whole Army system being now built on French lines. Formerly the Japanese Army was purely German, but since the defeat of Germany the Japanese have been converted to the French system. Apparently the Japanese do not yet realise that nothing which occurred in the recent war reflects any discredit on the German Army's methods of training. Germany was outnumbered and outfought, but German organisation, German training methods, German strategy and German tactics are still undefeated.

So far as one can learn French methods of training Japanese aviators are killing them at the rate of about ten a week. During the war the French themselves killed more aviators in training than were killed by the Germans on active service. This was partly due to bad methods of teaching and partly to bad maintenance of machines. Therefore it is natural that similar methods should be fatal in Japan, for the Japanese are not natural aviators.

### Can Japanese Fly?

This raises the question, interesting to French and British instructors alike, whether the Japanese can be taught to fly. It is a proved fact that any horse-riding race, such as the English, Americans, French, Canadians, Australians or Italians, fly quite naturally. Any good horseman will become a good pilot in a few days, provided he is not prevented by some personal defect, such as bad eyesight or broken nerve. In a nation such as Germany or Russia where the horse-riders are a class or a section of the people, the equestrian class will make the best pilots. Hence the fact that the best fighting pilots were of the class of the von Richthofens, Bölcke, Immelmann and Voss, whereas the N.C.O. pilots were as a rule only fit for slow, steady reconnaissance machines.

The Balkan people, Serbs, Bulgars and Greeks, cannot fly at all, for they are not horsemen. The Poles, cavalrymen by tradition, fly naturally but in a lunatic fashion which matches their temperament. The Swedes and Scandinavians generally are very bad pilots, with a few exceptions among their officer class. The Baltic peoples can find very few pilots. The Cossacks and other horse-riding Slavs and Tartars learn to fly easily, but are hopeless on the mechanical side of aviation owing to sheer lack of brain capacity.

### The Japanese Disability.

Now, nobody would accuse the Japanese of lack of brain. But they certainly are not horsemen. Remember Mr. Kipling's description of the Japanese cavalry :—"If the changes and chances of military service ever send you against Japanese troops, be tender with their cavalry. Put some fusees down for the horses to step on, and send out a fatigue party to pick up the remnants."

An Englishman who has lived many years in Japan discussing this question recently said that the Japanese will never make pilots because whenever a Jap is faced with a sudden emergency in anything mechanical he has one unfailing gesture, he throws up his hands and scratches his head to help him to think what the book says about it. And obviously an aeroplane in a flat spin near the ground does not leave much time for thinking about the book or scratching the head.

Nevertheless, out of a people numbering over seventy millions (very nearly double the population of Great Britain, mark you) it must be possible to find a few thousands who can fly, if only by the book, provided that the Japanese Government does not mind killing a few more thousands in finding them. And the Japanese have never in the past shown any particular objection to being killed.

### Recent Degeneration.

Incidentally, the modern Japanese view of being killed is one reason why Japan must hasten the outbreak of war. According to this same Anglo-Japanese friend everybody in Japan is convinced that a war with America must occur. So much are they convinced that a distinct class of "conscientious objectors" is growing among the students of the universities and technical schools. These degenerates go so far as to rejoice openly and shamelessly when disabled by some eye disease or other physical ailment which disqualifies them for military service.

This increasing objection to military service is tending to bring the war nearer, in that the Military Party know that if they are to have an army for the war they must get the war going before the anti-militarists acquire too much influence. Which seems eminently reasonable.

### Mexico's Part Against America.

Another interesting bit of information from an Englishman long resident in Japan is that it is commonly believed in that country that there is a secret treaty or some sort of working agreement between Mexico and Japan for the landing in and passing through Mexico of Japanese troops. Many Americans scoff at the idea of a Japanese invasion through Mexico, but it is a more reasonable proposition than a landing on the Pacific Coast of the States

A Naval attack on the Pacific Coast might well draw the whole of the U.S. Pacific Fleet to that area, and might force a concentration of the U.S. Naval and Military Air Services for the defence of San Francisco, Seattle and other cities. Which would leave the Mexican coast open for a Japanese landing and would leave the Mexican frontier of the United States open to an attack. That is assuming that the Japanese Fleet could defeat or at least hold the U.S. Fleet.

The idea of a Japanese conquest of the United States is, of course, absurd. But an attack from Mexico would be very worrying, and the Mexicans might well favour such an attack as a means of guaranteeing Mexico against American aggression in the future, assuming that the Japanese secured permanently the command of the Pacific and could impose on the United States a peace dictated by Japan.

It is at any rate certain that Mexico already swarms with Japanese, who run some of the biggest factories in Mexico City, including one for the manufacture of explosives, ostensibly for the mines.

In the event of an invasion through Mexico the Japanese Army Air Service would be used while their Naval Air Service was operating with their Fleet. But, as in the case of our own Naval Air Service in the past, the Japanese are evidently going to use land-going aeroplanes for their Naval pilots as well as sea machines. So perhaps it is intended that the warships which escort the troop-ships shall supply the aeroplanes and pilots for the preliminary air work of the expeditionary force.

### Japanese Orders in England.

At any rate it is evident that the Japanese themselves are convinced that their people can be taught to fly, or they would not have ordered aeroplanes as lavishly as they have done. What they have ordered in France one cannot say, but the orders placed already in England by the Japanese Navy alone must run into some millions of pounds.

One has not asked any British firms concerning their own orders, for if one had done so one would doubtless have been given the information in confidence. But it is currently reported that the Avro Company have about 100 training machines on order, in addition to which it is said that the Japanese Government has paid £30,000 for the drawings and manufacturing rights of the standard Avro biplane. Also it is said that 40 Nieuport "Nighthawks" have been bought from the Gloucestershire Aviation Co., that 30 or 40 machines of similar type with "B.R.2" engines, slightly modified and known as the "Sparrowhawk," have been ordered, and that the same firm is to make a quantity of Nieuport "London" triplanes, a two-engined bomber with a remarkably good performance and designed for quick and cheap production.

Furthermore, Short Brothers have sold a dozen or so seaplanes for training, and Mr. Oswald Short has recently been in Japan presumably to arrange further orders.

It is known that some of the best of the Sopwith and Handley Page technical people have gone to Japan to lay out the Japanese Naval Aircraft Factory, to put new designs in hand and to organise production.

Also it is known that some of our best R.N.A.S. instructors have gone to teach the Japanese Naval Air Service all that is known of air tactics at sea.

### Working to a Time Limit.

Our instructors do not expect to remain in Japan more than a year. Such, at any rate, is the length of their agreement. If that means anything it means that the Japanese hope to have learned so much in a year that they will then be able to go ahead themselves with the training of aviators and the building of machines and the organising of repair work.

Possibly by that time they may have found a certain number of Japanese who have a natural aptitude for flying and are competent to carry on instructional work. At any rate they may have produced a fairly large number of aerial chauffeurs who will be able to fly the inherently stable aeroplanes and seaplanes which the imported English designers will have produced by that time.

One can only hope that the English may succeed so far that a year hence the Japanese may think that they know all about aviation without any more foreign help. Obviously the Japanese will get rid of our people as soon as they can, for they will not want to have a lot of foreigners still intimately connected with their Naval training and their constructional factories during the eighteen months or two years before the war when they will be putting forward their utmost efforts for the mass-production of aviators and aircraft.

### A Precarious Position.

But one fears that if our people fail to get away before the big effort starts they will not be allowed to come away at all. Naturally the Japanese will not want people who know all about their Air Services to come back to England and forthwith transmit that knowledge to America. Therefore, if the return is unduly delayed one quite expects the Japanese officials to smile amiably and with the utmost courtesy quietly to put insurmountable obstacles in the way of the return of the Englishmen and women—for some have been so unwise as to take their wives or to arrange for them to go to Japan later. And one imagines that a war-mad Japanese mob would not distinguish too nicely between an Englishman, or woman, and an American.

The best that can happen is that they may all get home again in time to be of use to America when the war really starts. For any English-speaking person who knows Japan will then be of great value to our relatives across the Atlantic.

### America's Air Services.

Admittedly, as already stated, the combined U.S. Air Services are to-day in a position to stop the forthcoming war by attacking Japan at once. Attack is always the best defence, but they will not be allowed to attack. Even though the States have probably the biggest air forces in the World at the moment, they must wait to be attacked.

Meantime pacifists, copperheads, pussyfoots and the rest will be resisting all they know every attempt even to maintain, let alone increase, American air power. And even the heads of the American Air Services seem none too sound in their ideas.

If one may judge by his public utterances before political committees and such General Mitchell the Chief of the U.S. Army Air Service seems to think that he can sink battleships with bombs. American bombs and bombing may be very fine, but bombing battleships is just waste of time when torpedoes can be used.

An American friend writes suggesting that if the States had thirty squadrons of Martin Bombers on the Pacific Coast that coast would be safe against Japanese aggression. As a matter of fact they could not do so much to the Japanese Fleet as the mosquitoes did to the people who built the Panama Canal.

All the American guff about bombing battleships is based on a published diagram of bombs dropped on a field on which the outline of a battleship was drawn in chalk. Against a moving target, plus anti-aircraft gunfire, plus defensive aircraft the hits would be quite another story And even if the bombs did hit as per diagram they would do no very great harm to a ship with modern deck armour. If America is out for defence against warships let the U.S. Air Services get along with the development of torpedo aeroplanes such as the British and Germans used with good effect during the war, and such as Rear-Admiral Bradley X. Y. Z. Fiske most emphatically did not invent.

What America needs are plenty of long-range torpedo aeroplanes to keep the Japanese Fleet away from her coasts and plenty of good fast fighters operating from land to sink the Japanese bombing machines as they approach her coasts. With a goodly stock of these the Pacific Slope can be adequately protected. And strong detachments of similar machines might even save the Philippines and Hawaii.

In fact if the American Government had the pluck and foresight these American possessions in the Pacific might be made into the best possible defences of the Pacific Slope, seeing that sea and air fleets based thereon would be a continual threat to Japan's cities if the Japanese Fleet left Japan to attack America.

### The British Empire's Part.

Australia's fear and hatred of Japan is as great as or even greater than America's, so that whatever Great Britain does when the war begins, America can depend on Australia not to help Japan, and Australia will very probably act against Japan if all goes well. Australia is about to acquire a very useful little air fleet of torpedo-carriers and fighting machines, expressly with an eye to defending her coasts against Japan.

It is true that Australia's population is less than one twelfth that of Japan, but with so many first-class pilots available an Australian air fleet can be very deadly either in attack or defence. That means at any rate ultimately protection and help for American ships in the Pacific. Therefore one recommends that some sort of understanding be arranged between the American and Australian Air Services, with a view to co-operation when occasion demands.

Canada also, though deprived of material by parsimonious politicians, is worth consulting and bringing into the partnership for the preservation of the Freedom of the Pacific. In Canada the States can find some of our very best and most experienced seaplane and flying-boat officers and men. Anything that they can do to help against Japanese aggression will be done willingly. But it might be well to arrange plans privately beforehand. What they can do will have to be done as private individuals, for as in the case of Australia, Canada as a nation will not be in the war till some years after it has begun.

Obviously Japan will do all she can to keep the British Empire out of the war. But, equally obviously, Great Britain must be dragged into it if it lasts more than a few years, for after all we in England have to carry our share of the White Man's Burden. And the sanctity of any Anglo-Japanese Treaty which may be made this year is not going to interfere with out Imperial self-interests five years hence

It is to be hoped that the United States will settle Japan by themselves. But the worst of the American is that he is so horribly English, and so presumably just as we had to get the Spanish and Portuguese to help us win the Peninsula War, and Germans and Dutch to help us beat Napoleon, and twenty-two Allies to beat Germany, so probably America will want us in the end to help beat Japan. At any rate if we do so we may be able to cancel our war debt—moral and financial—to the United States. Meantime we Britishers wish well to the U.S. Fighting Services, and hope that they are preparing adequately for the struggle which lies before them by sea, land, and air.—C. G. G.

* * *

## AN INTERNATIONAL COURTESY.

The following letter has been received by Captain S. Cockerell, A.F.C., and Capt. F. C Broome, D.F.C., A.F.C., from the Aero Club of Belgium, in recognition of their flying of the Vickers Amphibian biplane (Rolls-Royce engine) at Antwerp in August last :—

"Sir,—In the name of the Aero Club of Belgium and the Organising Committee of the VIIIth Olympic Games Meeting, we have the honour and the pleasure to send to you, as a token of respect, one of the medals struck on the occasion of this great International Air Exhibition.

"We seize this opportunity to congratulate you once more on the sportsmanlike performances which you achieved during these tests."

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## OSWALD WATT.

Lieut.-Colonel Oswald Watt, D.S.O., was drowned in Sydney Harbour last week. He was in his forty-fourth year. No details have yet been received as to how the accident happened except that it was not an aeroplane accident.

Oswald Watt was one of the best men Australia has produced, for he was an Australian though born at Bournemouth. The son of a very wealthy landowner of Scottish origin he had for the asking everything that a young man could desire, yet instead of being spoiled by being a will unto himself as are so many men under similar circumstances he was in fact one of the most useful of men.

He began to take a practical interest in aviation very early in the history of flying, for the new means of locomotion appealed to him both as a sportsman and as a soldier—he being at that time a Captain in the Australian Army. He learned to fly on Salisbury Plain at the Bristol School where Mr. Harry Busteed, now Wing Commander R.A.F., was his instructor. His certificate is No. 112, dated Aug. 1st, 1911. As he was born on Feb. 11, 1878, he was even then rather old to become a pilot, as flying was then very much a young man's game.

Thereafter, not loving the English climate any more than does anybody else who can get away from it, he bought a Blériot and took it to Egypt, where he did a great deal of flying in the Winter of 1911-12, receiving additional instruction from that good little sportsman the late Marc Pourpe, the first man to fly from Cairo to Khartoum and back. And later he flew a great deal in France.

At the outbreak of war Oswald Watt was in Paris. During those dark days at the beginning of August when we all doubted whether our feeble Government of the day would join France or not, Oswald Watt, impatient at England's delay, went and joined the French Service d'Aviation Militaire, in which he was given the rank of Captain, in recognition of his Australian rank, though being an alien he could not hold a command.

He had the good fortune to be posted to that distinguished squadron at Toul in which were such gallant pilots as Louis Noel, Seth Jansen and Charles Hubert. With that squadron he served for a year or so and won the Legion of Honour and the Croix de Guerre with either two or three palms for mentions in Army Orders.

When the first Australian squadrons began to arrive in England Oswald Watt was transferred to the Australian Flying Corps and took command of a scout squadron which made a high reputation for itself. During General Byng's attack on Cambrai in November, 1917, Major Watt's Australian squadron, flying low on "Camels" in thick fog, attacked the enemy on the ground with bombs and machine-gun fire, doing great execution but suffering heavily in consequence. Of the eighteen pilots six received the Military Cross, the highest number ever given in one squadron for one day's work. But those six were the sole survivors of the squadron. Oswald Watt himself received the D.S.O., and none has ever deserved it better.

Shortly afterwards Oswald Watt was promoted to Lieut.-Colonel and appointed to command a Wing near Gloucester. This Wing was composed entirely of Australian units in training and was the biggest command ever held by an Australian aviator in time of war. It was in fact considerably bigger than is the whole Australian Flying Corps to-day.

Soon after the ending of hostilities Colonel Watt sailed for Australia with a shipload of officers and men of the A.F.C. His home and nearly all his relations, including his son, were in England, but he conceived it to be his duty to go to Australia to see that his flying people were properly treated by the Government and to do his best to advance the cause of aviation in Australia. He helped to resuscitate the Australian Aero Club and generally he threw his good will and energy into everything which would make for the development of flying.

He might have remained in the Australian Flying Corps, and he would have probably become its chief, but he preferred to become a civilian so that his wealth and his personal and political influence, which were very great, could be used in the good cause. None in Australia realised better than he the need for a strong Australian air force as a guard for Australia's coasts against Asiatic aggression. Like all intelligent Australians, he saw the Japanese peril in the Pacific and saw that it was for Australia to maintain an adequate defensive Air Fleet where a Sea Fleet would be impossible.

His death ends a career which was in fact only beginning and it robs Australia of one of her most valuable citizens.

Oswald Watt was personally one of the most lovable characters imaginable. To any woman he might have seemed one of the heroes of old romance come to life. His tall, powerful, athletic frame, his brown, sun-burned face and keen gray eyes made him the typical *beau sábreur*.

He had a fine brain with great political foresight, and if at times he was inclined to be impulsive and go too far, it was always on a generous impulse for the good of somebody else. He was given to keen enthusiasms, but his equally keen sense of humour prevented his enthusiasm from turning him into a fanatic. He was good nature personified and the last three years of his life have been practically devoted to looking after the future welfare of his "boys," as he regarded the young officers and men of the Australian Flying Corps.

The British Empire in general and the Commonwealth of Australia in particular can ill spare Oswald Watt in these troublous times. The best that we can hope is that before his death he may have begun a movement in Australia which those who knew and loved him will carry on for his sake and as a monument to his memory. Australia has sent us many fine men who have done great work for Aviation and for the Empire, but none quite so splendid as Oswald Watt.—C. G. G.

## A. H. FORSON.

It is with profound regret that one has to record the death on May 19th of Mr. Andrew H. Forson, one of the first regular air line pilots in this country.

A message from San Sebastian states that Mr. Forson was on his way to Madrid to deliver a British aeroplane. Almost immediately after leaving the Lasarte Aerodrome he ran into a fog and finally crashed in the mountains near the village of Anzuola. Peasants who rushed to the rescue found that Mr. Forson was already dead.

It will be recalled that Mr. Forson left Croydon Aerodrome on April 24th in Bristol tourer M-AAEA. This machine he was to deliver on behalf of the Bristol Aeroplane Co. to a private owner in Madrid. He was then to return to Paris to collect a similar machine flown thither by Mr. Uwins and fly it also to Madrid. On which machine the accident occurred is doubtful, but owing to the length of time since he started from Croydon, it seems probable that he had delivered the first machine safely and that at the time of the accident he was on his way to Madrid with the second one, M-AEAA.

The news of Mr. Forson's death reached Croydon on Saturday morning and cast a gloom over the whole place, where he was universally popular. He was for some time a pilot in the now defunct A.T. and T. and was one of the best pilots of the D.H.18. After the cessation of A.T. and T. he joined the Aircraft Disposal Company as a delivery pilot and quite recently he flew a number of machines for the company to Brussels.

He was one of the few pilots who really went in seriously for the study of aerial navigation. It will be remembered that he made a remarkable flight from Paris to Lympne in the teeth of a gale in the closing weeks of last year. On that occasion he never saw the ground between Beauvais and Lympne, and flew entirely by compass and dead reckoning.

It may also be recalled that he left Croydon for Madrid on his last flight from there in a torrential downpour, knowing that he would probably strike fine weather before he reached the coast, which in fact he did.

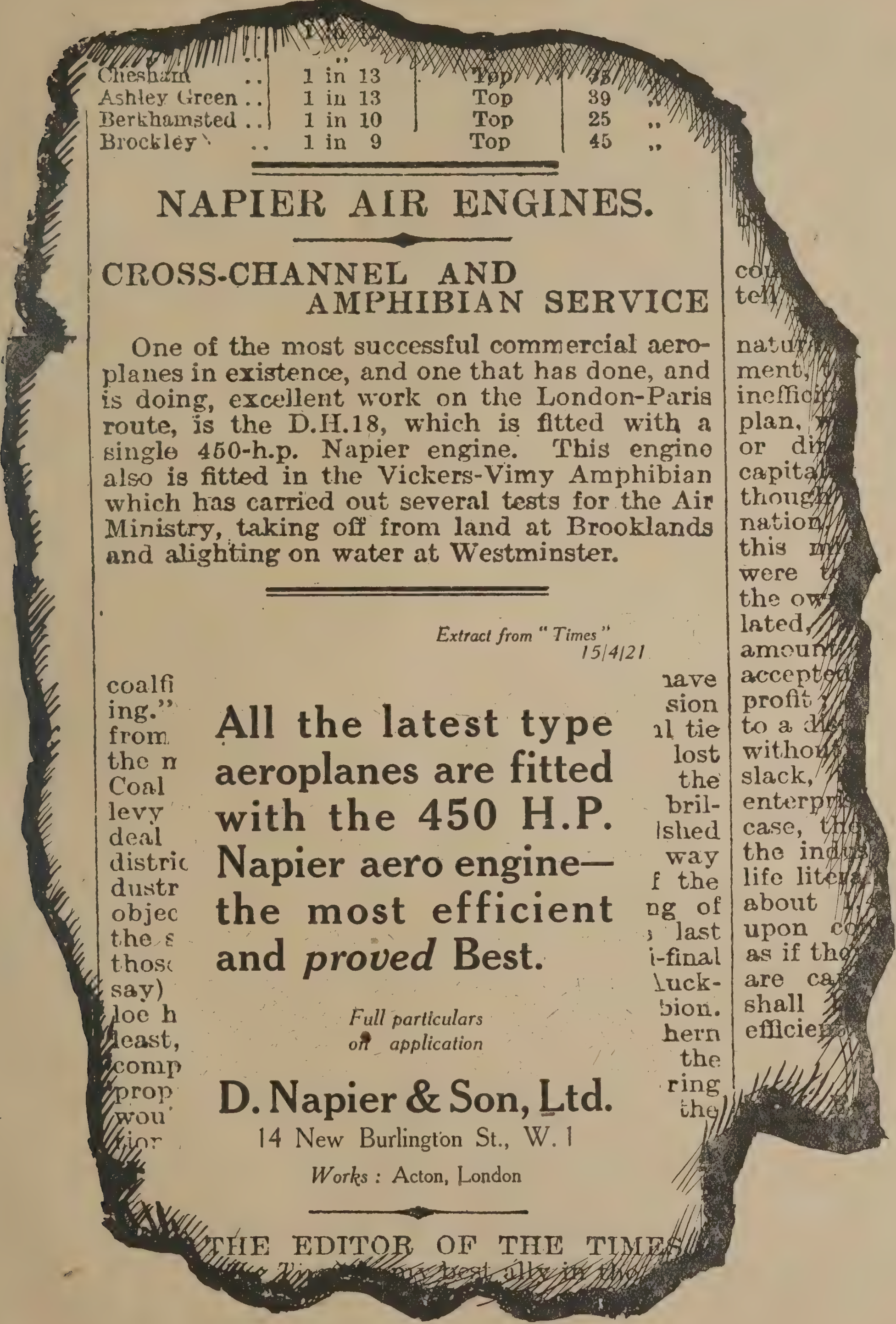
Everyone at Croydon unanimously expressed the opinion that Mr. Forson was one of the finest and most reliable of Civilian pilots, and owing to his knowledge of navigation looked forward to the time when he would be captain of a big trans-Atlantic air liner, as undoubtedly it will be men of his type and ability to whom these commands will be entrusted.

Owing to this knowledge of navigation and the extreme care with which he always flew, he was regarded by those who knew him as one of the foremost civil pilots. He had built for himself a similarly high reputation in the Royal Flying Corps and later in the Royal Air Force.

At the outbreak of war he was given a commission in the infantry and as early as 1915 he applied to be transferred to the R.F.C. after being severely wounded in France. However, owing to heavy casualties in his regiment he was asked to defer his transfer until a later date, which he did, finally transferring about the middle of 1916.

He was a Scotsman and was 28 years of age. Possessed of a keen sense of humour, he enjoyed having his leg pulled and always gave back as good as he received.

He will be greatly missed by all his friends, and by his death International Civil Aviation suffers one of its most severe losses since its revival after the war.—G. D.



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| Berkhamsted .. | 1 in 10 | Top | 25 ,, |
| Brockley .. | 1 in 9 | Top | 45 ,, |

# NAPIER AIR ENGINES.

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One of the most successful commercial aeroplanes in existence, and one that has done, and is doing, excellent work on the London-Paris route, is the D.H.18, which is fitted with a single 450-h.p. Napier engine. This engine also is fitted in the Vickers-Vimy Amphibian which has carried out several tests for the Air Ministry, taking off from land at Brooklands and alighting on water at Westminster.

*Extract from "Times"*
*15/4/21*

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THE EDITOR OF THE TIMES

# NAVAL AND MILITARY AERONAUTICS.

## The R.A.F. at Olympia.

H.M. the King was present at the opening of the Royal Tournament at Olympia on May 19th. The guard of honour at the entrance was found by the School of Technical Training, Cranwell, under Flt.-Lieut G. H. Lawrence.

Among those present at the opening performance were Major-Gen. Sir F. H. Sykes, Air Com. P. W. Game and Air Com. H. R. M. Brooke Popham

In the tug-of-war between Navy, Army and Air Force teams, the R.A.F. (Halton) beat the 1st West Yorks Regt.

## The Belgian Croix de Guerre.

The King has authorised Wing Comdr. Louis Greig to wear the Croix de Guerre, conferred on him by the King of the Belgians for valuable services rendered in connection with the war.

## Waziristan Awards.

The King has approved of the following rewards for gallantry and meritorious service :—

Distinguished Flying Medal.—Kelly, No. 247939 L.A.C. W. J., R.A.F. (Waziristan).

Meritorious Service Medal.—Clark, No. 5263 Sergt. C., R.A.F. (Mesopotamia); Dowle, No 107500 L.A.C. (A.Cpl.) W. H., R.A.F. (Waziristan); Greenwood, No. 18473 Sergt. S., R.A.F. (Waziristan); Hammond, No. 6606 Flt. Sergt. F. G., R.A.F. (Waziristan); Kingston, No. 401704 Flt. Sergt. L. F., R.A.F. (Waziristan); Unitt, No. 55149 Flt. Sergt N., R.A.F. (Waziristan).

## Japs at Farnborough.

The Crown Prince of Japan was present at Farnborough on May 17th at an exhibition of flying by the R.A.F. stationed there. The Prince was received by Sqdn. Ldr. A. R. C. Cooper, O.C., and Mr. Sydney Smith, Superintendent of the R.A.E. The flying was done on three S.E.5s, a Bat, a Camel and an Avro. A parachute descent was made from a Vimy.

## An Indian Civil Service Appointment.

In the list of nominations to the Indian Civil Service is included Capt. R. P. Ward, M.C., D.F.C.

## R.A.F. Boxing.

The third annual meeting to decide the Boxing Championship of the R.A.F. was held at Halton Camp on May 18th and 19th.

The details of the finals are as follows :—

Officers.

Light Heavy-Weight.—Final.—Pilot Officer Drabble (Kenley) beat F.O. Clarke (Upavon) in one round.

Middle-Weight.—Final.—F.O. Page (Upavon) beat F.O. Ingram (Beaconhill) on points.

Welter-Weight.—Final.—F.O Garrity (Halton) beat F.O. Rowe (Netheravon) on points.

Light-Weight.—Final.—Flight Lieut. Smith (Halton) beat F.O. Smith (Glasgow) in first round, referee stopping bout.

Heavy Weights.—Final.—Flight Lieut. Brady (Halton) k.o. Flight Lieut. Usher (Netheravon) in first round

Feather Weights.—Final.—F.O. Howard (Flowerdown) beat F.O. Horsley (Kenley) on points.

Other Ranks.

Fly-Weight.—Final.—Millington (Halton) and McKenzie (Henlow) declared no contest in second round, after having been previously warned for not doing their best.

Bantam-Weight.—Final.—Sallows (Flowerdown) beat Wells (Uxbridge), who retired in the second round.

Feather-Weight.—Final).—Carter (Halton) beat Cottington (Henlow) in the second round.

Light-Weight.—Final.—Stone (Winchester) beat Mullen (Uxbridge), who retired in the second round.

Welter-Weight.—Final.—Mills (Uxbridge) beat Brady (Flowerdown) on points.

Middle-Weight.—Final.—Higgens (Cranwell) beat Jackson (Uxbridge) on points.

Light-Heavy-Weights.—Final.—Fairbrass (Cranwell) beat Blythe (Winchester), the holder, on points.

Heavy-Weight.—Final.—Cpl. Leary (Felixstowe) knocked out A.-C. (2) Cracknell (Winchester) in the first round.

Boys.

Midgets.—Final.—Booth (Cranwell) beat Cork (Cranwell) on points.

Paper-Weight.—Final.—Brooks (Cranwell) beat Harrington (Cranwell) on points.

Fly-Weight.—Final.—White (Cranwell) beat Kelly (Cranwell) on points.

Bantam-Weight.—Final.—Faulkner beat Barrett on points.

Feather-Weights.—Final.—Aitken (Cranwell) beat Blaze (Cranwell) on points.

Light-Weight.—Final.—Nichols (Cranwell) beat Stockwell (Cranwell) on points.

Middle-Weight.—Final.—Wilson (Cranwell) beat Roberts (Henlow) on points.

Welter Weights.—Final.—Garner beat Appleyard on points, after an extra round.

Light-Heavy-Weights.—Final.—Ockenden (Cranwell) beat Hanna (Cranwell) on points.

Heavy Weights.—Final.—Steele (Cranwell) beat Deakin (Cranwell) on points.

## MESOPOTAMIA.

According to news received at the War Office from Mesopotamia, aerial demonstrations have taken place over the Nasiriyeh area, as a result of recent manifestations of unrest, and in view of their reported good effect, are being continued.

## SOUTH AFRICA.

### The S.A. Air Force.

The following notice, both in the form of a paragraph and an advertisement, appeared in the Cape Town *Argus* on April 26th with regard to recruiting for the S.A. Air Force.

Applications are now being invited by the Director of Air Services for appointments as officers in the South African Air Force. Three flight-commanders, 17 flying officers and other officers for executive and technical positions, including one wireless officer, are required. Selections to fill the posts will be carried out by a committee appointed by the Minister of Defence, and will be subject to medical fitness.

Rates of pay will be as for the permanent force. These at present range from £471 to £562 per annum for lieutenants, and £626 to £717 for captains (unmarried), inclusive of allowances. Applicants must state their experience and qualifications, and will receive forms to be completed and returned. It is not likely that any selected candidates will be required to take up their appointments until the latter half of this year.

## UNITED STATES OF AMERICA.

### Survey of Cyclone-swept Timber Zone.

It has been reported that the Army Air Service and the Department of Agriculture are co-operating in making an aerial survey of the timber zone of Olympic Peninsula, Wash., which was swept by a cyclone on Jan. 29th of this year. The area of destruction has been estimated at 2,250 square miles, involving the estimated loss of from 8,000,000,000 to 12,000,000,000 feet, board measure, of timber. It is estimated that the cost of the survey from the air will not exceed 500 dols. By making use of the aeroplane survey as a basis for the plan of salvage and protection considerable saving will be made, not only in the cost, but also in time, a particularly important factor where further severe loss may occur through forest fires, the combating of which would be seriously hampered by the blown down timber.

### Death of Lieut. Coney.

While attempting to lower his previous record of 22 hr. 27 min. flying time across the United States, Lieut. W. D. Coney, U.S. Army Air Service, in attempting to fly from Jacksonville, Flo., to San Diego, Cal., was forced down near Crowville, La., owing to engine trouble. As the result of the fall, Lieut. Coney's back was broken, causing complete paralysis of his body from the chest downward, from which he died on March 30th.

* * *

## THE HANDASYDE AIRCRAFT CO., LTD.

The following letter has been received :—

Carlton House, 11d, Regent Street, S.W.1,
May 23rd, 1921.

Sir,—As there have been various statements in the Press coupling Mr. Handasyde with Martinsyde Ltd., especially in reference to the design of a new machine for the Aerial Derby, we should be grateful if you would issue some statement of the facts, which are as follows :—

Mr. Handasyde, together with the writer, who were both directors of Martinsyde Ltd., resigned about six months ago and are no longer interested in that firm.

This syndicate was formed by us for the express purpose of designing aircraft on progressive lines and we have at the present time under construction in co-operation with another firm a machine which will probably be entered for the Aerial Derby.

We think it right to make this statement as Mr. Handasyde appears to have been identified with a monoplane with cantilever wings which has been stated to be under construction by Martinsyde Ltd.

The description answers the design upon which we are now working, although it is of course unknown to us whether or not Martinsyde have a similar machine under construction.

As is well known, Mr. Handasyde was designer of the "Semi-Quaver" which won the Aerial Derby last year, and of other well-known machines constructed by Martinsyde Ltd. in the past.

It should be clearly understood that Mr. Handasyde is no longer connected with the Martinsyde firm.

(Signed) Hamilton Fulton,
On behalf of the Handasyde Aircraft Co. Ltd.

*Yet another proof of the reliability of*

ROLLS-ROYCE

AERO ENGINES

**From the Portuguese Naval Air Service**

"I am pleased to inform you that the F3-4018 type hydro-aeroplane with two Rolls-Royce 'Eagle VIII' engines which we brought from England to Lisbon by air in 1920 has just made a direct flight of 540 miles from Lisbon to Funchal (Isle of Madeira).

"Your engines gave complete satisfaction, once again demonstrating that the fame of Rolls-Royce products is well deserved.

"I take great pleasure in informing you of this achievement, and you may make use of this letter in any way you think fit."

ARTHUR DE SACADURA CABRAL, Lieut.-Commander

*Rolls-Royce Engines made the first direct flight across the Atlantic, also the first flights from England to Australia, and England to South Africa.*

**ROLLS-ROYCE, Ltd., 15, Conduit Street, London, W.1.**

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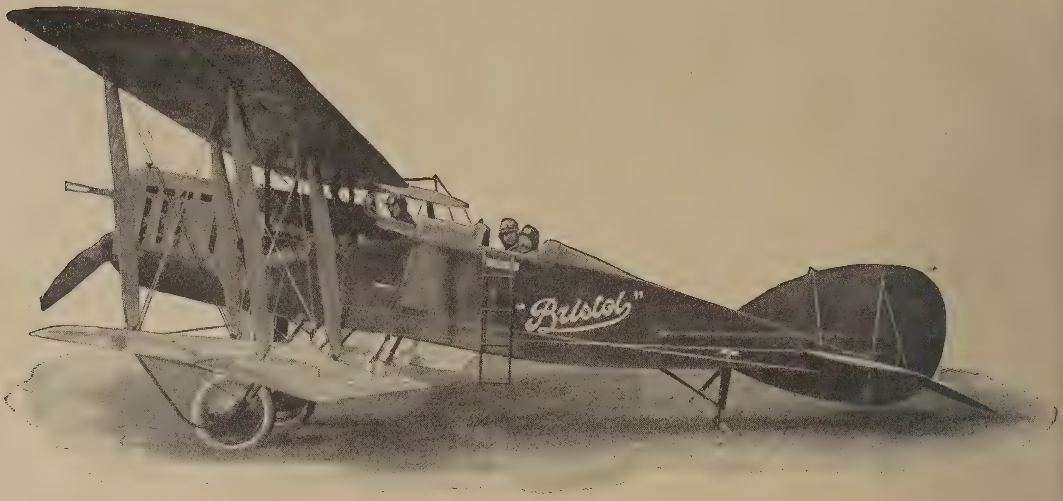

# The "Bristol" Three-Seater Tourer

AS high-speed cross-country touring machines the two- and three-seater "BRISTOL" Tourer Biplanes are becoming increasingly well known and appreciated in many parts of the world.

The high-powered engine, large tank capacity and sturdy construction which characterise the "BRISTOL" Tourer, combined with excellent stability and manœuvrability, provide a machine suitable for safe and comfortable flying in all weather conditions, and capable also of landing in, and alighting from, very constricted areas.

Charges for upkeep and renewals are maintained at a minimum and the moderate initial cost of the Tourer allows of a sound revenue return on capital outlay.

With a full complement of petrol (70 gallons) a revenue load of 400 lbs. may be transported. This, of course, may be proportionately increased if fuel for a shorter period is carried. The load, for instance, may be varied thus:—

| *With fuel for* | *Revenue load* |
|---|---|
| 100 *miles* | 860 *lbs.* |
| 200 ,, | 760 ,, |
| 300 ,, | 660 ,, |
| 500 ,, | 460 ,, |

Serviceable, reliable and of high performance, the "BRISTOL" Tourer types are well adapted for all purposes of private and commercial aviation.

Write for further particulars to:—

**THE BRISTOL AEROPLANE Co., Ltd.,**
Designers and Constructors of
Aircraft and Aero Engines,
**FILTON —— BRISTOL.**
*Telephone:* 3906 *Bristol.* *Telegrams: Aviation, Bristol.*

The
"Bristol" Aeroplanes

# AERONAUTICAL ENGINEERING

## SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

The second of the articles on "Variable and Other Wings" printed below deals with the practical difficulties which arise when an attempt is made to use the qualities of the variable camber aerofoils described in the first article, and points out the conditions under which such wings have proved successful.

The type of variable camber wing which has a moveable leading as well as trailing edge is then considered.

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Scale drawings and a short description of a three-engined monoplane now under construction by the Morane-Saulnier works appear on page 484.

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A description of the German M-type semi-rigid airships designed by Herr Basenach appears in this issue. It is interesting to discover that one ship of this type was adapted for mooring out, and was successfully moored to the stem of a light cruiser.

It is understood that the L.F.G. concern now own the rights in Herr Basenach's design and hope to develop the type for commercial purposes.

---

A correspondent objects—at some length—to the Editor's recent criticism of the Fokker FIII monoplane. The Technical Editor cannot accept responsibility for "The" Editor's incursions into technical controversies.

---

A second correspondent corrects a criticism of a book on the History of Aeronautics. The Literary Editor wishes it to be understood that he cannot accept responsibility for the Technical Editor's incursions into literature.

## ON VARIABLE AND OTHER WINGS.—II.

Variable camber flaps of the type generally described in the previous instalment of this article have now been used by various designers for some considerable time Only one firm, the Fairey Aviation Co. Ltd., has used them consistently, and it is known to be the opinion of some designers and some pilots that even as used by that concern the results obtained are not of any great value. This would indicate that there are in practice certain countervailing disadvantages to the undoubted aerodynamic gains which can be attained by such variable camber devices.

### The Weight of Flap Gears.

Mr. F. M. Green, who was largely concerned with the experimental work of the Royal Aircraft Factory in the early days, has publicly stated that their experience with a machine with this type of gear showed that the effect of the extra weight entailed by fitting flaps wiped out the effect of the aerodynamic gains. No very definite information is available as to the methods of construction and operation used in these R.A.F. experiments, and it is possible that the construction was unduly heavy, but obviously this question of extra weight must be considered.

The extra weight involved is by no means limited to that of the special operating gear for the flaps. The fitting of flaps over the whole wing increases the weight of the wings themselves. In the case of the fixed wing the trailing ends of the wing ribs overhang from the rear spar as cantilevers. They are carried directly from the spars, and the loads on these rib overhangs serve to reduce the bending moment on the portions of the ribs between the wing spars.

With flaps, the trailing edge ribs require a separate spar parallel and close to the rear wing spar. This extra spar can, and does, help to take the load of the normal rear spar and makes it possible to use a lighter spar, but the two together will invariably be heavier than the single spar of a fixed wing need be. The bending loads on the ribs of the fixed part of the wings becomes greater, and the ribs themselves may have to be strengthened. Some form of gear for carrying the load on the flaps and preventing them from folding up becomes essential.

This supporting gear is also the flap controlling gear, and so does not directly increase the weight beyond that otherwise essential, but it almost certainly means applying a number of fairly intense concentrated loads on the fixed wing structure, instead of the distributed load caused by the fixed trailing edge. This again may mean heavier main spars. Altogether it is impossible to give any estimate—even approximate—of the added weight which may be involved. Without very careful design and contrivance the extra weight may be very great, and it can scarcely avoid being appreciable.

### The Evil Effect of Added Weight.

At first sight it would appear that a high lift wing, whose advantages may disappear if it is called on to carry a little extra load, is scarcely worthy of the name, but the evil effects of added weight are little to do with their effects on wing loading. If the weight due directly or indirectly to the variable camber gear is such that the small variable wings are heavier than the larger fixed wings giving the same landing speed, the result is an increase in the weight per h.p. of the completed machine, and the effect on performance of an increased load per h.p. is very much greater than the effect of increased wing loading. But given good design there is still possible an overall saving in the power required for a given useful load and a given speed range, if flaps are used. In some cases it is a small saving and it may not be worth the cost of making that saving.

### Where Flaps have Justified Their Weight.

In this connection it is distinctly interesting to consider the special purposes for which alone it has been considered worth while to use this form of variable wing. As already remarked, only the Fairey Company have consistently used this arrangement. The machines upon which they have used flaps have all been designed in the first place for the uses of the Naval side of the Royal Air Force, and the majority of them have been seaplanes.

Every British official specification for Naval aircraft of moderate size issued of recent years has been insistent in its demands for limited overall dimensions, for low landing speeds, and for a quick get-off, all combined with a fairly high useful load relatively to the power available. Obviously small overall dimensions means small wing area, therefore high wing-loading, low landing speed and quick get-off under these conditions call for a high lift wing, while the high speeds asked for call for a high speed wing.

Specially in the case of seaplanes, is a quick get-off facilitated by a high lift, for the resistance of the floats or hull always reaches a very high value at some speed just below that at which the floats get "on top" of the water. There are a fair number of seaplanes which require considerably more power to get on top of the water than they need to fly. The more lift the wings are able to give at low speeds, the less is the power required to get the floats out. Therefore it may be expected that seaplanes will offer a greater scope for the use of such devices than will machines of the land-going type.

Despite this some allege that such flaps produce little good results, and some pilots will affirm that they can land machines fitted with flaps rather slower with the flaps up than they can with them pulled down. There are quite a number of possible explanations of this belief

### Troubles Due to Flaps.

In the first place, if the pilot flattens out to minimum speed with the flaps up and then attempts to reduce speed still further by pulling the flaps down, it is possible that the increased angle of incidence caused by pulling the flaps down may carry the wing past its stalling angle, and the machine under these conditions will fall into the sea with a loud crash.

Also, as the flaps are pulled down, the balance of the machine is altered, because the C.P. of the wings moves. Generally speaking, the C.P. moves aft, making the machine tail light, and at the same time it is almost inevitable that the lateral control will become heavier, because the loading on the ailerons increases as the C.P. moves aft. Such a proceeding is very apt to give the pilot an impression that he is at the point of stalling, and may cause him to land faster than is at all necessary.

On the other hand, with certain wing sections the C.P. may move forward, making the machine tail heavy, and precipitating the stall, which is almost certainly approached if the flaps are pulled down at the last minute.

The remedy is fairly obvious. The flaps should be pulled down some time before the stalling speed with flaps up is reached, and all risk of "jumping" the stalling speed with flaps down is then avoided.

To overcome the trouble due to change of balance when the flaps are used, Mr. Fairey has devised and patented a device whereby the flap control, and the control of the adjustable tail-plane are interconnected and movement of the flaps also entails movement of the tail-plane to such an extent as to keep the machine in unaltered trim. This device should be of considerable service and should suffice to remove most of the remaining prejudices against flapped wings.

### The Best Type of Wing for Use with Flaps.

The most satisfactory results are obtained with this type of variable camber gear when it is applied to a good high-speed wing section, and the flaps are used merely to give a lowered landing speed and a quick get-off. In some early trials the opposite course was followed—a high lift section was the basis of design and the flaps were pulled up to give a higher top speed than would have been possible with the basic section.

The reason for this procedure was that it was hoped in this way to improve climb and ceiling, using the high lift section, and at the same time to allow of the development of really high speed in a dive. The results were not satisfactory.

This was partly due to the fact that the high lift sections available were not very good, and were not sufficiently loaded up to make full use of the properties they did possess, and to the fact that a reasonably good high lift wing—that is one with a fairly high L/D—cannot be turned into a good high-speed wing by altering its trailing edge alone.

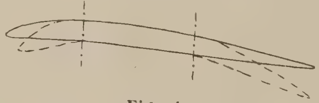

Fig. 4.

In Fig. 4 is shown, in full lines, the general form of the usual type of slightly cambered high-speed wing Pulling down the nose shape to that shown in dotted lines will spoil this wing almost completely, as far as the L/D at high speeds is concerned. Altering the nose and the trailing edge to the dotted form may make of it quite a fair high lift wing—i.e., one with not only a high maximum lift, but one with reasonably good high speed qualities.

Pulling down the trailing edge alone turns it into a wing with a high maximum lift—even then not so high as if the nose is pulled down as well—but does not make a wing with good L/D qualities at fine angles of attack.

Therefore one can turn a good high-speed wing into one giving a low landing speed by the use of trailing edge flaps, but one cannot turn a good high lift wing into a reasonably good high-speed wing unless the nose is altered as well. If one adds a nose flap to the trailing edge flaps, one can very considerably improve the aerodynamic qualities of the flapped wing. One can probably even improve on R.A.F.15 for high speeds by turning both nose and trailing edge up slightly, and one can certainly get better results at medium and slow speeds by turning both nose and tail down at the same time.

### Leading and Trailing Edge Flaps.

Such wings have been built and flown. The Dayton-Wright monoplane entered for the last Gordon-Bennett Race was fitted with such wings, and a diagram of the gear used for control is shown. In this machine the highest possible speed was, of course, the object of the design, and a very high loading was carried on a wing of very small mean camber. The flap gear was designed solely to give as low a landing and getting-off speed as possible. In addition the camber gear was inter-connected with the undercarriage retracting gear, i.e., to wind ones wings up to the high-speed section meant winding the undercarriage up into the fuselage.

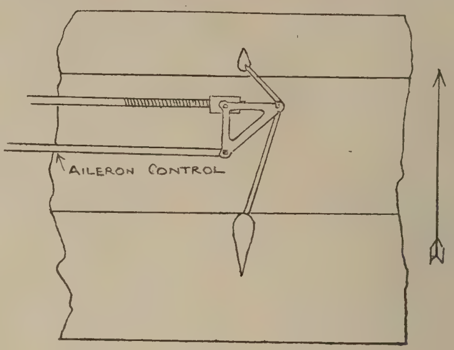

Fig. 5.

From Fig. 5 it can be seen that both fore and aft flaps are coupled to the lateral control gear, which consists of a push and pull rod coupled to one arm of a bell-crank lever, the other arm being coupled by two rods to king posts on the two flaps. The fulcrum of the bell-crank is fixed to a nut carried on the screwed end of the camber control shaft and movement of this nut shortens or lengthens the distance between the two flap king posts. Unfortunately no data are available from which it is possible to estimate the effectiveness of this particular example.

The Sanders' "Kittiwake" amphibian is fitted with wings of a similar type. The camber operating gear is shown in Fig. 6 herewith. The gaps in the upper surface of the wing are closed in by strips of flexible sheet metal, fixed to the central part of the wing and free to slide in slotted guides on the moving flaps. The flaps are not used as ailerons, separate control surfaces being carried midway between the wings.

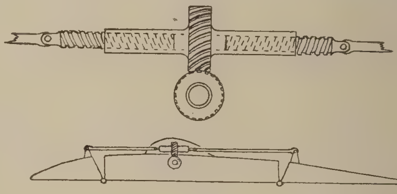

Fig. 6.

A transverse shaft carrying a number of worms passes along the wings between the spars. Each worm gears with a worm wheel carrying right- and left-handed internally screwed sleeves. Screws within these sleeves operate push-and-pull rods coupled to king-posts on the flaps.

Here again there is little available information as to the results attained. It is known that the machine's low speed is appreciably reduced by the use of the flaps, but no definite performance figures have yet been published.

### Tests of Double Flaps.

Certain wind tunnel tests have been made by the N.P.L. on models of wings of this type, and they seem to indicate that there are very considerable possibilities of obtaining a very wide speed range by the use of these double flaps. More recently a series of tests have been made in America on behalf of the Glenn L. Martin Co. with thick wings—suitable for cantilever, or internally braced construction—fitted with double flaps. These seem to show that it is possible by such methods to obtain a wing which will carry 10 lb. per sq. ft. at 45 m.p.h. when the flaps are down, and will yet have high speed qualities equal to those of R.A.F.15.

On the other hand, it is fairly obvious that the double flaps must call for a considerable amount of complexity and weight in the operating gear, and a further addition to the structural weight of the wings themselves—as compared to the single flap system. It is possible to obtain with a fixed wing a maximum lift as high as that of the flapped wing, and the sole advantage of the flaps is an increased efficiency at finer angles than that of maximum lift. It is an open question whether the extra weight of gear will not so increase the load per h.p. that except in racing and high-speed military machines no real gain will result, for with moderately high power loadings—15 lb. per h.p. or over—the high lift fixed wing adequately loaded compares very favourably with the high-speed wing. If the variable camber gear means say 16 lb. per h.p. instead of 15 lb. per h.p., one can probably get as high a speed, a better climb, and certainly a lower landing speed, with a decent high lift section fixed.

*(To be continued.)*

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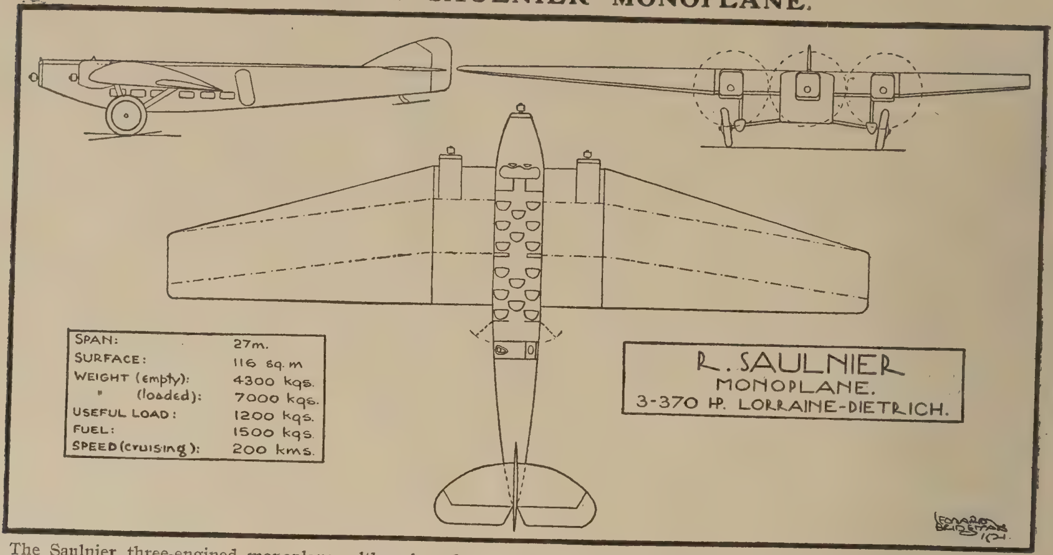
# THE R. SAULNIER MONOPLANE.



| | |
|---|---|
| SPAN: | 27m. |
| SURFACE: | 116 sq. m |
| WEIGHT (empty): | 4300 kgs. |
| " (loaded): | 7000 kgs. |
| USEFUL LOAD: | 1200 kgs. |
| FUEL: | 1500 kgs. |
| SPEED (cruising): | 200 kms. |

The Saulnier three-engined monoplane, although a departure in construction, cannot be called a departure in type when the majority of the previous Morane-Saulnier productions are recalled to mind. The names of such pilots as Vedrines, Brindejonc des Moulinais, Marc Pourpe, Gilbert, Garros, etc., will always be connected with the little Morane-Saulnier monoplane, and in this country it was that type of machine on which Gustav Hamel, Slack, Marty, and Walter Brock did so much good work at Hendon before the war. During the war the Morane "Parasol" and the "Bullet" were the only type of monoplanes used in any quantity by both the French and British air services, and it was on the latter type of machine that firing through the airscrew was first accomplished by means of the deflector plate. That Saulnier should produce a commercial monoplane, therefore, seems only natural, his principal departure being in the employment of all metal construction and cantilever wings.

In general appearance the Saulnier monoplane is reminiscent of the Zeppelin-Staaken monoplane. It is built entirely of metal, with the exception of the wing and fuselage covering, which is of fabric. The wing spars are in the form of lattice girders built up of duralumin. Two 370-h.p. Lorraine-Dietrich engines are carried in the wings, the engine bearers being built out from the front main spars. From the engine housing to the fuselage, in the space formed in between the leading edge and the front spar, is a tunnel, along which mechanics can gain access to the wing engines. A third engine of the same type and h.p. is carried in the nose of the fuselage. The petrol tanks are carried behind the wing engines in between the wing spars, and are fitted with a species of rip-panel to evacuate all petrol in case of fire. Sufficient fuel is carried to allow of a flight of seven hours without landing.

A spacious cabin contains accommodation for 16 passengers. In front of the cabin and under the pilot's seat is a luggage space of 1.5 sq. metres. The pilot and assistant pilot or mechanic are situated directly behind the nose engine and just in advance of the leading edge of the main plane.

The undercarriage consists of two Vees, one under each wing engine, the axles, carrying one large wheel at the outer end, being hinged to the bottom longerons of the fuselage and suspended at the apex of the Vees in the usual manner. The tail unit is quite normal and consists of fin, tail plane, balanced elevators and rudder.

A model tested at the Eiffel Laboratories has given exceedingly promising results. A full-sized version is being constructed partly at the Morane-Saulnier works and partly at the Lorraine-Dietrich works, and it will be assembled at the Blériot factories at Suresnes.

## AIRCRAFT AT JUTLAND.

The following letter has been received :—

Sir,—I should like to draw your attention to a paragraph in the May 11th issue of The Aeroplane, on page 438, in the Aeronautical Engineering Section.

In the review of "A History of Aeronautics," by E. Charles Vivian, there is a paragraph questioning the accuracy of the "History" with regard to the Seaplane Reconnaissance at Jutland.

The reviewer's statement that the *Campania* was well behind the battle cruisers is substantially true, in that, while the B.C.S. were off Jutland, *Campania* was in the neighbourhood of Scapa Flow.

Flt.-Lieut. Rutland flew No. 8359 (Westland Short) from H.M.S. *Engadine*. At the moment of his start we were three miles in advance of the B.Cs., and the action was well commenced while we were still between the opposing Fleets, in a somewhat exposed position perhaps, but, nevertheless, commanding an excellent view of the opening phases.

Admiral Beatty himself expressed, verbally and in the *Gazette*, appreciation of the value of the signals sent by Asst.-Paym. Trewin, the observer.

Further flights were knocked on the head by the sea becoming very choppy, rendering it impossible to launch or hoist machines without vital damage to planes, elevators, etc.

We had no deck-launching gear then, but although about the oldest, were apparently the only Seaplane Carrier capable of maintaining the necessary 20 knots to stick to the B.Cs. at sea.

I am sure that the meticulous accuracy for which your paper is well known will cause you to correct the general trend of the reviewer's paragraph.

Best wishes for The Aeroplane and Aviation generally.

(Sgd.) Graham Donald.
(late Flt. Commdr. R.N., and of H.M.S. *Engadine*.)

[The reviewer tenders his apologies to H.M.S. *Engadine* and all concerned for the inexcusable error of suggesting that the *Campania* and not the *Engadine* was the ship responsible for the seaplane reconnaissance at the Battle of Jutland. He has also to apologise if his criticism of the statement contained in "The History of Aeronautics" reads as a criticism of the value of that reconnaissance.

The passage in question gave him (the reviewer) the impression that it was claimed that valuable information was obtained during the later stages of the action—which was not the fact—but a more leisurely re-reading shows that the construction he placed upon the passage is not warranted by the wording.

He has therefore to apologise to the authors as well.]

## AN ITALIAN AERONAUTICAL CONGRESS.

In connection with an exhibition which is being held at the Stadium, Turin, from May 14th to June 12th, there is to be a National Aeronautical Congress extending from June 6th to 9th inclusive. The congress is held under the patronage of the Aero Club of Italy, and is to be organised by the Societa Aviazone Torino.

The exhibition itself includes two sections devoted to aeronautics; one historical, wherein is included machines and equipment of ancient date, the other modern, which covers modern aircraft and accessories.

# NEW SUNBEAM-COATALEN — AIRCRAFT ENGINES —

## AT SPECIALLY REDUCED PRICES.

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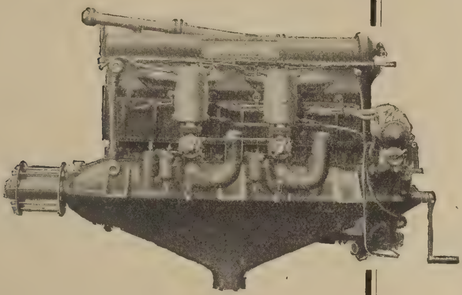
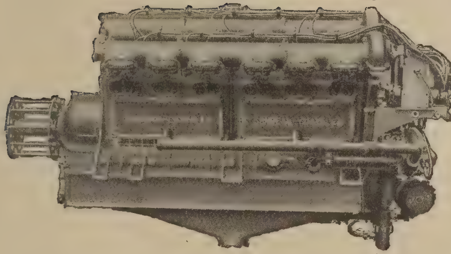


### 100 h.p. 6-Cylinder Vertical "DYAK."

This is the most reliable aero engine yet built, and was fitted to large numbers of small non-rigid airships for the British, Japanese and Norwegian Governments. It has also been successfully applied to Avro aeroplanes, motor cars and motor boats.

Price - **£295.**

(Current catalogue price for this type of engine, **£950**.)



### 300 h.p. 12-Cylinder "V" Type "MANITOU."

This engine is the logical development of the successful "Maori" I, II, III, and IV, types of which many hundreds were fitted by the British and French Admiralties to seaplanes operating in the North Sea and Mediterranean. This engine has a very low power weight ratio, and is extremely reliable.

Price - **£395.**

(Current catalogue price for this type of engine, **£1,250**.)

*We shall be pleased to supply full specifications, installation diagrams and any other information on request.*

Examples of these engines may be seen at the following Depots and Agencies:

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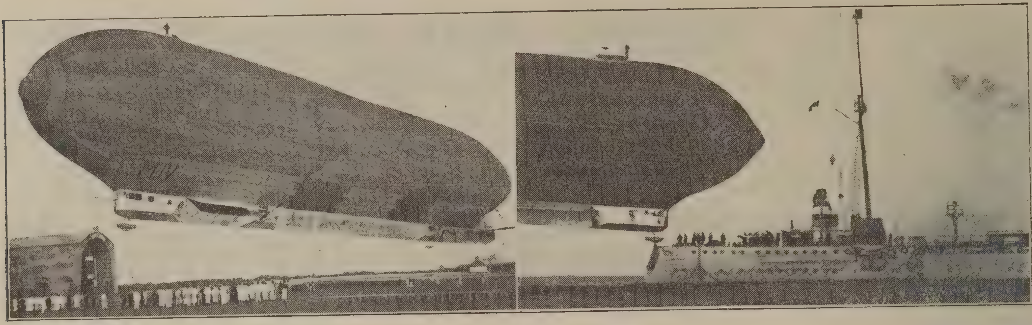
**Southern Service & Repair Works - - - - 177, THE VALE, ACTON, LONDON, W.3.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

# THE GERMAN M-TYPE AIRSHIPS.



THE BASENACH M.IV SEMI-RIGID.—On the left about to land. On the right, moored to the stern of the light cruiser "Amazone." Note the top gun platform.

It has long been known that before and during the war Germany possessed certain airships which had been designed and built by the aeronautical section of the Army at their official factory at Berlin-Reinickendorf. These ships were in general known either as the "M" type or as "Gross" airships, after the name of the officer commanding the establishment which produced them.

Very considerable secrecy was observed as to these ships, but this veil has been lifted since the suppression of the German airship scervice, and some interesting information is now available as to their construction and performance.

The "M" type ships were designed by Herr Nikolas Basenach, who was engineer-in-chief at the said works Herr Basenach in 1906 suggested the experimental construction of an airship of 1,800 cub. metres capacity, and his proposal was approved. The general design of the ship approached in principal the French "Lebaudy" airship, though the external form was entirely different, the ship being a semi-rigid with a steel-tube frame work below the envelope.

Two two-bladed airscrews, one on each side of the keel girder, were driven by bevel gears from a transverse shaft, which shaft in turn was belt driven by a 24 h.p. Gaggenau car engine. The first trials were actually made with a 30-h.p. Antoinette engine, but this was removed as it failed to function satisfactorily.

A rudder and tail plane were fitted to the end of the rigid framing. Longitudinal control was effected by a steel chain of a weight of about 50 kg., which could be traversed along the keel by a rope and pulley mechanism. This chain served also as a landing device—just as a trail rope is sometimes used in free balloons—for as it reached the earth the balloon was relieved of its weight gradually and downward way was checked. This ship made numerous flights of up to three hours' duration and supplied much valuable data for future designs.

The second ship designed by Herr Basenach was known as M.I. This was also a semi-rigid of 5,000 cub. metres capacity. The length was 65.5 metres and the height overall 23 metres. Two 75-h.p. Korting engines, specially built for the purpose, drove each a three-bladed airscrew, one on each side. The steel framework below the envelope was in three sections with hinged joints between, somewhat after the fashion of certain Italian semi-rigids.

Two ballonets were fitted within the envelope

The weight of the airship structure complete was 4,698 kg.; and the disposable load was 1,300 kg A speed of 46 km.p.h. was attained and the airship generally fulfilled the designer's hopes. The ship was completed in 1908, and on the 11th of September in that year made a flight of 13 hours.

M.II was an improved version of M.I, with somewhat better performance, and made a 16½-hours' flight in August, 1909.

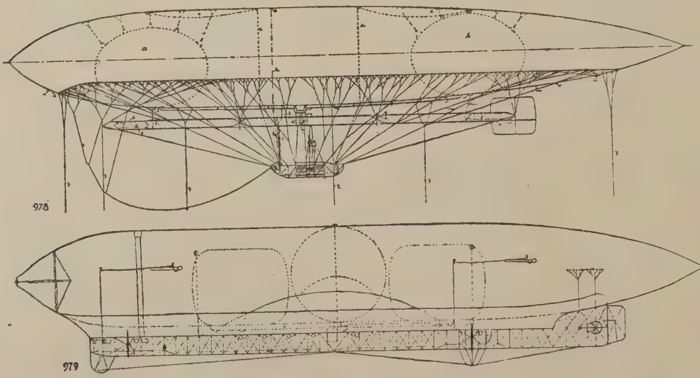
M.III, the next of the type, was designed for a considerably increased speed. She was of 7,800 cub. metres capacity and fitted with four 75-h.p. Korting engines. These engines were installed in a nacelle suspended below the keel girder and were arranged in two pairs, each pair rope driving one airscrew carried from and above the nacelle. The general arrangement of this ship is shown in a figure It weighed empty 6,595 kg., and the disposable load was 2,000 kg. On trials in January, 1910, a speed of 16.4 metres per sec. (59 km.p.h.) was attained, the ship thus being the fastest airship of her period.

M.III was later enlarged to 9,000 cub. metres capacity, a gear drive was substituted for the rope drive, improved airscrews were fitted, and a speed of 19 metres per sec. (68.4 km.p.h.) was reached.

An M.IV was now designed to give a greater disposable lift. This ship was on the lines of M.III, but with two separate nacelles; but the results were unsatisfactory, particularly as the Zeppelins of this date were improving rapidly, and the authorities lost interest in the Basenach design.

Herr Basenach, however, was undiscouraged, and finally succeeded in having a second M.IV put in hand. This M.IV was of 13,500 cub. metres, roughtly 100 metres long, and with gas containers divided into three compartments. An articulated steel framework was attached as close up as possible to the envelope. The framework was in the form of a corridor, containing control and engine compartments, and was covered in and faired into the envelope proper by fabric covering. The whole of the suspension gear, and all controls, cables, etc., were thus entirely enclosed. Below the keel were two shock absorbers, each containing fabric floats for alighting on water.

Three 160-h.p. Maybach engines were fitted, one ahead driving two side two-bladed screws, the two others being in-



SCALE DRAWINGS OF THE BASENACH SEMI-RIGID AIRSHIPS M.III and M.IV.—M.III (top) is distinguished by the very complicated rigging exposed to the air, and for the fact that the nacelle is suspended a considerable distance below the rigid keel girder M.IV (bottom) is the ship shown in the photographs at the top of the page. The keel girder is rigged close up to the envelope, and contains the engine and crew spaces. The whole girder is covered and faired into the envelope with great reduction in the resistance and consequent gain in speed.

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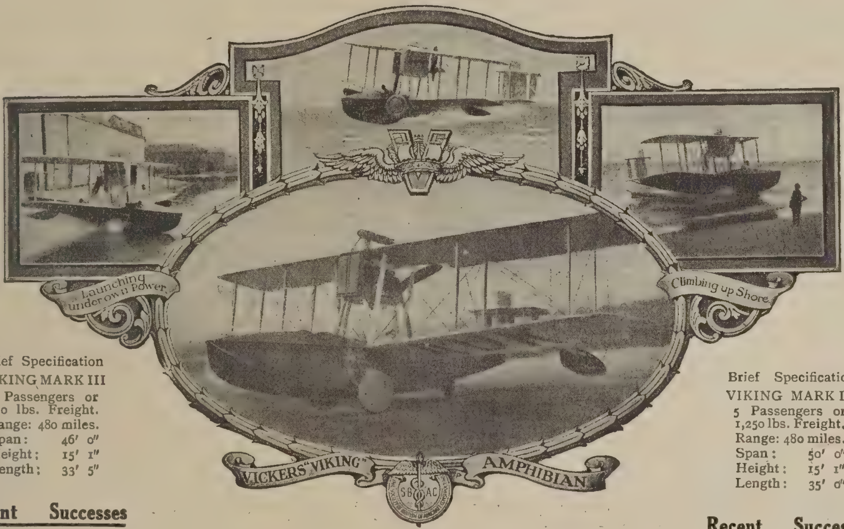

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Height: 15′ 1″
Length: 33′ 5″

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VIKING MARK IV
5 Passengers or
1,250 lbs. Freight.
Range: 480 miles.
Span: 50′ 0″
Height: 15′ 1″
Length: 35′ 0″

**Recent Successes**

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July 1920

1. **Shortest time in "unsticking" from water.**
2. **Fastest time over a given circuit.**
3. **Climb to 1,000 metres.**
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**Recent Successes**

The Vickers Viking was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION September. 1920

Aviation Department,
VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

stalled well aft and driving each a four-bladed airscrew. A gun platform was fitted on top of the envelope forward, with a ladder way through the envelope, and two machine guns were carried there.

First trials of this ship were made in August, 1913, and a speed of 82 km.p.h. was attained, a figure which the authorities refused to believe till a race between M.IV and a Zeppelin of the Z.IV type proved the semi-rigid to be the faster of the two ships. Owing to the ship length being limited to 100 metres by the size of the shed in which it was built, the shape of the ship was far from ideal, and the high speed reached was solely due to the suppression of exposed suspensions and the fairing in of the keel to form one body with the envelope. In the summer of 1914 M.IV was enlarged to 19,550 cub. metres. The disposable weight became 7,000 kg., no bad result considering that the light materials now available were not yet developed.

The most interesting feature of M.IV is the fact that the bow shock absorber was fitted with mooring attachments, intended to allow of mooring in the open. It is stated that this ship could be safely moored to a fitting on the ground only a few centimetres in height, and left to ride in strong winds. Such a method of mooring is impossible in the case of a rigid, as the ship would rapidly bump to pieces on the ground, but it is claimed that the semi-rigid type with the articulated type of girder suffers no damage from this cause. Obviously there are considerable advantages to be gained from the absence of any mooring mast, if this claim is well founded. M.IV has been moored to the stern of a light cruiser under way and towed with success, and there certainly seem to be advantages in this type of construction if such results can be attained safely and certainly.

Herr Basenach has since the war designed two other airships generally of M.IV type for commercial purposes, one of 25,000 cub. metres, 150 metres long, to be fitted with four 250-h.p. engines, giving a maximum speed of 112 km.p.h., with a disposable lift of 16,000 kg., and the second of 110,000 cub. metres, 210 metres long, with eight engines, and a speed of 128 km.p.h.

The smaller is designed to carry 100 passengers with a range of 1,850 km. at full speed, or 2,560 km. at cruising speed. The larger ship is estimated to be capable of carrying 200 passengers with a range of 14,700 km. at full speed, or 21,700 km. at cruising speed.

## CONCERNING THE FOKKER MONOPLANE.

The following letter has been received :—

Croydon Aerodrome, May 14th, 1921.

Sir,—I was extremely surprised at your criticism of the Fokker F.III in The Aeroplane last week. As I am one of the pilots whose business it is to fly these machines on the London-Amsterdam service, I have naturally given the question of safety very careful consideration.

In the first place I was not quite satisfied with the position of the pilot, as it was obvious that in the event of a forced landing in the sea his seat would be submerged. However, as you suggest, a young and active pilot would probably be able to get out quickly onto the plane, especially as he would have the advantage of knowing what was about to happen.

The passengers however are perfectly safe in such a case. A very simple hydrostatical calculation shows that the machine floats with the leading edge submerged and the cabin door out of the water, so that the passengers have only to adjust their belts and step out. The plane being absolutely watertight floats indefinitely and is sufficiently buoyant to float several times the weight of a fully-loaded machine.

It is, as far as I know, the only really watertight plane in existence. Hence it is possible to calculate accurately the position the machine takes in the water when in equilibrium. Such a calculation is difficult or impossible for most other aeroplanes, as the power of flotation of the wings is an uncertain factor.

The best position for the petrol tank is a very debatable point. The placing of it in the undercarriage has certain advantages in case of fire, as Mr. Fokker himself proved by a very daring practical experiment while in flight. However this may be, I consider that storing the petrol below the cabin floor as you suggest is the most dangerous procedure that one could adopt.

I have been flying for a considerable time on many types of aeroplane and have naturally had a good many forced landings. Of these about 70 per cent. have been due to defective petrol supply due to long and complicated piping, or the failure of one of the many kinds of petrol or air-pressure pump. In the Fokker there is a simple gravity feed through a short pipe and with a big head of petrol.

As regards the question of an airworthiness certificate not having been issued for this machine, the London Aerodrome manager of the K.L.M. applied verbally to the proper authorities to have the machine inspected by the A.I.D. He was told that this could not be done as Holland has not yet signed the Air Convention. He then applied in writing to have the machine inspected officially or unofficially by any competent Government inspector (if available). So far he has had no reply.

I have now flown the Fokker F.III for a considerable time on cross-country work, and I consider the useful view to be obtained from it better than that from any other machine except, perhaps, an F.E.2b. It is true that there is no backward view, but one hopes that there will be no need to fight on the Fokker.

The Fokker firm has made many structural tests on the Fokker and states that the factor of safety of the plane attachments is 18. All these machines have to pass a very strict Air Ministry examination in Holland, so I am not greatly alarmed lest the plane should come off in the air.

I should also like to protest against the view expressed or implied in your columns a few weeks ago that in the event of another war the present civilian pilots would be of no use as war pilots, or at the best would be useful only as pilots of large and clumsy bombing machines. As a matter of fact all the present civilian pilots are old war pilots, and most of them are scout pilots. The K.L.M., recognising the need for scout pilots to keep in practice, is providing its pilots with single-seater machines. Would that British firms would do the same.

(Signed) R. E. Duke.

### A Reply.

[It is interesting to have the opinion of so experienced a pilot as Mr. Duke on the points raised in his letter. At the same time one still has grave doubts on the flotation question. The door of the cabin in the Fokker monoplane is directly under the wings and so if the machine floats, as Mr. Duke says, with the cabin door out of the water, the fuselage of the machine must be almost vertical when the machine is in the water.

One very much doubts the possibility of the machine floating in this position owing to the fact that the fuselage and, therefore, the weight of the cabin and passengers and tail, together with the weight of the undercarriage, are all below the wings when in a flying position, and would therefore tend to pull the wings more or less flat onto the water. If the cabin itself were watertight then conceivably the flotation of the cabin added to the flotation of the wings might keep the tail vertical and most of the door out of the water, but directly the door was opened the water would rush in and pull the tail down. The only proof of Mr. Duke's assertion which would be really convincing would be a photograph of the machine actually in the water with the cabin door open and the passengers in the cabin.

Even assuming that Mr. Duke's statement is absolutely correct, there still remains the fact that if the machine came down in anything like a heavy sea the fuselage and undercarriage would very soon be broken up and the only chance the passengers would have would be the chance of the wings holding together like a raft, and owing to their construction there is very little to which the passengers could hold while in the water. Therefore one still maintains that there should be an emergency exit in the roof and that the machine should carry some sort of detachable life-saving raft similar to that made by Austin of Swansea.

It is not quite clear why storing petrol below the cabin floor should be any more dangerous than carrying it in the undercarriage or in the wings. In the event of a bad smash the tank in the wings would be very likely to burst and discharge itself over the engine, whereas when carried under the cabin floor it would be a greater distance away from the engine. In any case, the tank could be in two pieces in the wings, one on each side of the fuselage, thus leaving the centre section clear for an emergency exit.

It is interesting to hear that Mr. Leverton has applied for British airworthiness certificates for the Fokker machines, and one fails to see why such certificates should not be issued. Surely the question of whether a certain country has or has not signed the Air Convention has no bearing on the question as to whether in fact its machines are airworthy or not, and if they are not airworthy British passengers should be warned against travelling in them

It is very probable that the wing attachments are adequately strong. But there is considerable doubt as to the absolute trustworthiness of the fuselage bracing to which reference was made in the article to which Mr. Duke refers.

Finally, there is the question of regular air line pilots being of use as war pilots. Mr. Duke is absolutely correct in his statement that the present civilian pilots are old war pilots; and most of them very good war pilots. That is quite as it should be in the present state of affairs where the ground organisation of all air lines is thoroughly inefficient and where a pilot has to use his wits on occasion just as quickly as if he were engaged in war flying. One was not discussing present-day civilian pilots, but the ordinary air line pilot of the future.

Such an air line pilot will be quite a different person. He will be required to do at least six hours' solid flying per day and very probably eight hours, on four or five days a week. In fact, he will be an aerial chauffeur or engine driver pure and simple.

For such work the temperament of the war pilot is absolutely unsuited. One would merely ask each and every pilot who is flying on air line work to-day whether he contemplates seriously flying day after day over the same route till he retires with an old age pension. That is what the regular line pilot will have to contemplate in the future just as a railway engine driver does at present. One does not believe for a moment that a man of such temperament would be of any use as a war pilot, any more than even the best of main line express engine drivers to-day would be temperamentally suited to drive a "tank" in time of war.—C. G. G.]

## FOREIGN NOTES.

### CANADA.

#### Information Wanted.

The Aero Club of Canada has just organised a new department which is known as the "Aeronautical Development Section." The work of this section will be to collect, record and distribute all kinds of information of aeronautical interest which will probably be issued through special bulletins.

By way of laying a foundation for the dissemination of information the Secretary of the Aero Club, Mr. A. J. Hember, would be glad to receive from all firms in or connected with the Aircraft Industry copies of their catalogues. Also he would like to have copies of all aeronautical periodicals, whether in English or any other language. Also he would be obliged if aeronautical societies or other organisations of a similar nature would send copies of their proceedings and copies of papers read before their societies to the Aero Club of Canada. In fact, anything in the way of information concerning the development of aeronautics will be very welcome.

On the other hand, if manufacturers of aircraft or anybody else concerned with the Aircraft Industry or with Commercial Aviation or with the Sport of Flying desires to have information concerning developments in Canada, Mr. Hember will be pleased to supply such information as is within his knowledge. As the Aero Club of Canada is in constant and close touch with the majority of those people in Canada who are interested in aeronautics this new Department should be of very great use, both as a source of information to those in and those out of Canada. All letters should be addressed to the Secretary, The Aero Club of Canada, 34, Yonge Street, Toronto, Canada.

### FRANCE.

#### New Official Designs.

In the recent competition for war machine designs, all sent in were accepted, but divided into two classes. A for immediate execution, B to be put in hand after the class A are out of the shops. Three new designers only were in the first class—M. de Wattine, until now chief designer for M.M. Latecoère; M. de Monge of the Société Lumière; M. Wibault, who has already an order for six of his light bombers.

M. Wibault's history is a little curious, as he was already known for aero research before the war. During the war he was behind the lines not far from Lille, and as he has a club foot was not put to work by the Germans. He installed a small wind tunnel in a granary and went on with his original researches. Several times he was arrested for having concealed apparatus, but as the military people did not know the use of the tunnel he was let off. Late in 1918 he escaped to France, and designed a single-seater fighter which was tested just after the Armistice and turned out to be as good as contemporary machines by well-known and experienced designers.

#### Airworthiness.

There is going to be a better control on the airworthiness of machines immediately before each flight. The French Government is telling off a qualified ground engineer to each Air Company for this purpose.

The Belgian Authorities have also come to a similar decision. These decisions are the result of the demand of the Union of Canton Insurance Society and of Lloyd's Aviation Committee for such a control, details of which had been communicated in the ordinary way to our Allies.—J. S.

### ITALY.

#### A New Parachute.

On Saturday, March 12th, some interesting experiments were made near Rome with a new type of parachute designed by Ing. Nobile of the Italian Department of Aeronautical Construction. The parachute is designed to support the weight of the crew and nacelle of a small dirigible.

In the tests a captive balloon was used, and from a height of 300 metres Ing. Zesi, who was in the balloon basket, detached the car, which descended slowly supported by the Nobile parachute. The experiment, which was the first of its kind, was witnessed by many important personages, amongst whom were the various foreign Air Attachés and the members of the American and Spanish Aeronautical Missions.

## TRADE NOTES.

### A Cheery House Journal.

The officials and employees of a steel works at the present time can scarcely be having an enjoyable time. Making bricks without straw is nowadays the usual method one believes, but even the Chosen People could scarcely make steel without fuel. Yet despite the disorder into which the coal strike must have thrown their business, the staff and employees of Thos. Firth and Sons, Ltd., Sheffield, retain their well-developed sense of the mutuality of interests to a sufficient extent to maintain the firm's house journal—"The Bombshell"—at the level of interest and literary interest which has always distinguished it.

The May number of this always interesting magazine is full of cheering news as to the sporting and social organisations connected with the firm, as well as matters of more general interest.

### A Visit to Cellon.

On a recent occasion one had the pleasure of being shown over the works of Cellon (Richmond) Ltd. by Mr. A. J. A. Wallace Barr, the managing director.

Owing to the inflammable nature of dope, all cigarettes, pipes and other lethal weapons have to be extinguished on entering the works.

The works themselves before they fell into the hands of Mr. Wallace Barr were a brewery, and owing to a certain similarity in process in the brewing of both dope and beer, they required very little structural alteration. Though, of course, the firm are not working "all out" as they were during the war, one noticed that there was a considerable amount of dope actually being brewed and dispatched to buyers.

On the roof there are various tests dope frames, some of which have been out since the beginning of the war. The way in which many of them have withstood the ravages of weather and time is sufficient testimony of the efficacy of Cellon.

One next visited the chemical laboratory where Mr. Wallace Barr and his accomplice vied with one another as to who could find the bottle with the most nauseating aroma, with oneself in the doubtfully pleasant rôle of judge. However, there were no casualties on that front. [Not after training with *that* pipe.—Ed.]

Before leaving one was shown a canoe which was covered with aluminium dope which not only rendered it impervious to weather, but also distinctly pleasing to the eye. The old doped fabric which had just been removed had been on the canoe for three years. Despite the fact that it had been in constant use all that time, the dope showed little signs of deterioration.—G. D.

## TECHNICAL HOWLERS.

School-boy howlers are always a joy and technical howlers are equally entertaining. As a combination of the two it would be hard to beat the answers of a boy-mechanic in the R.A.F. which are reproduced below. This lad was not even threatened with intelligence, but he was a genuine trier, and he did his best to learn parrot-fashion everything his instructors told him. Here is the dire result :—

220-B.H.P. Beardmore.

(6) The bore is 145 m/m the stroke is 190 m/m revolutions per minute. 1350.

(12) To avoid accidents see that all clocks is undone and that all air is alright and see that the swiths is off.

The Mechanic swith off petrol on suck Sir.

The Pilot swith off petrol on suck

The Mechanic all clanker contickter Sir. (All clear. Contact, sir!).

The Pilot all clanker contickter.

(3) Clearance left between the valve and tappit if there was on clearance the valve could not be opertated.

(1) The four principal parts is the 2 magnetos the pistions the oiling system and the 2 carbureterers the Otto sycle is made of steel.

(11) The connesting rod is made of H section, and is held in position by 4 nuts and bolts and is fasttend to the crank pin on the crankshaft and then to the gudgeonnpin in the piston which is in the cylinder.

(4) The four important rules in useing tools is never lever them about the next is see that you take the number of tools back you brout and never yous a spanscer that is to big for the nut, and never hit enerthink where where a steel hamer.

(10) You would time a engine by pointing the pointer to the Z.E.R.O

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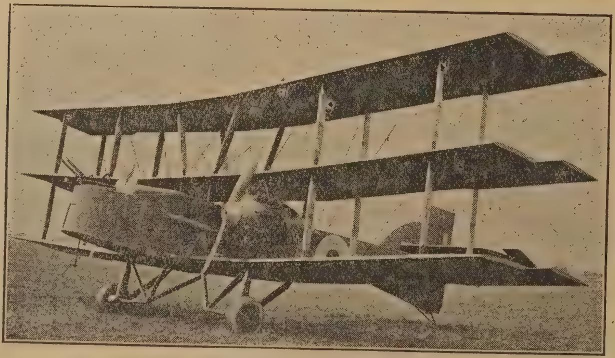

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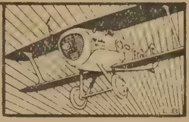

## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS:—B.A.—Berkshire Aviation Company. B.C.—Bristol Aeroplane Company. C.A.—Dept. of Civil Aviation. F.R.—Franco-Roumanie G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line K.L. Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes. M W.—Marconi Wireless Telegraph Co. Ltd. N.L.—Nordiska Luftrederi Akticbolaget. P.L.—Petters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aeriens (S.N.E.T.A.). B.M.—Brompton Motor Co.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

#### MAY 16th:

K.L., Fokker, H-NABN, London-A'dam, 10.26-15.35, G.M., 3, Hofstra.
M.A., Breguet, F-CMAI, London-Paris, 10.48-14.20, G., 2, Rauge.
I.L., Vimy, G-EASI, London-Paris, 12.30-14.52, G., 3, Chattaway.
S.N., DH9, O-BATA, Brussels-London, 12 14-14.47, G.M., 1, Sahnovsky.
G.E., Goliath, F-GEAC, Paris-London, 12.37-15.39, G., 8, Bechler & 1.
K.L., Fokker, H-NABL, A'dam-London, 13.00-16.55, Nil, 1, Holmes.
M.A., Spad, F-ACME, Paris-London, 16.20-18.55, Nil, 4, Challoux.
M.A., Breguet, F-CMAC, Paris-London, 16.00-18.45, Nil, 4, Auille.

#### MAY 17th:

M.A., Spad, F-CMAV, London-Paris, 10.10-12.20, Nil, 1, Delily.
K.L., Fokker, H-NABJ, London-A'dam, 10.17-14.40, G.M., 2, Holmes.
S.N., DH9, O-BATA, London-Brussels, 12.54-15.27, G.M., 1, Sahnovsky.
G.E., Goliath, F-GEAC, London-Paris, 12.55-15.34, G., 1, Bechler & 1.
M.A., Breguet, F-CMAC, London-Paris, 16.12-18.30, Nil, 2, Auille.
M.A., Breguet, F-RENE, Paris-London, 09.45-13.55, G.M., 1, Charpentier
I.L., Vimy, G-EASI, Paris-London, 11.15-14.15, G., 7, Chattaway.
S.N., DH4, O-BARI, Brussels-London, 12.10-14.20, G.M., 2, Delzenne.
M.A., Spad, F-CMAY, Paris-London, 13.37-15.55, G.M., Nil, Le Sec.
K.L., Fokker, H-NABN, A'dam-London, 14.00-17.10, G.M., 2, Olley.
M.A., Breguet, F-CMAA, Paris-London, 16.35-19.27, Nil, 4, Briere.

#### MAY 18th:

K.L., Fokker, H-NABL, London-A'dam, 10.56-14.12, G.M., 2, Olley.
I.L., DH18, G-EARO, London-Paris, 12.26-14.50, G.M., 8, Powell.
S.N., DH4, O-BARI, London-Brussels, 12.37-15.03, G.M., 1, Delzenne.
M.A., Spad, F-CMAY, London-Paris, 15.00-17.05, G., Nil, Le Sec.
M.A., Breguet, F-CMAA, London-Paris, 16.50-19.10, Nil, 2, Briere.
M.A., Breguet, F-CMAI, Paris-London, 09.40-12.47, G.M., 2, Donelin.
S.N., DH9, O-BIEN, Brussels-London, 11.52-14.20, G.M., 2, Sahnovsky.
M.A., Spad, F-CMAV, Paris-London, 12.45-15.15, G.M., Nil, Delily.
G.E., Goliath, F-GEAB, Paris-London, 13.00-16.03, G., 13, Favreau & 1
K.L., Fokker, H-NABJ, A'dam-London, 14.00-16 45, G.M., 2, Hofstra.
M.A., Breguet, F-CMAB, Paris-London, 16.05-20.10, M., 2, De Perignon.

#### MAY 19th:

M.A., Breguet, F-RENE, London-Paris, 10.15-12.55, G., 2, Charpentier.
K.L., Fokker, H-NABN, London-A'dam, 10.17-14.00, G M., 3, Hofstra.
S.N., DH4, O-BIEN, London-Brussels, 12.25-15.02, G.M., Nil, Sahnovcky.
G.E., Goliath, F-GEAB, London-Paris, 14.20-17.15, G., 4, Favreau & 1.
M.A., Breguet, F-CMAI, London-Paris, 16.10-28.55, Nil, 2, Donelin.
M.A., Spad, F-CMAV, London-Paris, 16.25-18.45, Nil, 1, Delily.
K.L., DH9, H-NABO, London-A'dam, 18.01-20.10, G., Nil, Hinchliffe.
I.L., DH18, G-EARO, Paris-London, 11.09-13.34, G., 5, Powell.
M.A., Breguet, F-CMAM, Paris-London, 12.30-14.50, Nil, Paille.
K.L., DH9, H-NABO, Dortmund-London, 12.55-16.15, Nil, 2, Hinchliffe.
K.L., Fokker, H-NABL, A'dam-London, 14.05-17.10, G.M., 1, Holmes.
S.N., DH9, O-BELG, Brussels-London, 14.24-17.40, G.M., Nil, Catta.

#### MAY 20th:

K.L., Fokker, H-NABJ, London-A'dam, 10.18—, G.M., 1, Duke.
M.A., Breguet, F-CMAF, London-Paris, 10.52-20.05, G., Nil, Challoux.
I.L., DH18, G-EARO, London-Paris, 12.37-15.05, G.M., 8, Chattaway.
M.A., Breguet, F-CMAB, London-Paris, 12.50-18.10, Nil, 3, De Perignon.
S.N., DH9, O-BELG, London-Brussels, 12.52-15.15, G.M., 2, Catta.
M.A., Breguet, F-CMAM, London-Paris, 15.55-20.10, G., 3, Paille.
G.E., Goliath, F-FHMY, Paris-London, —11.15, G., 2, Labouchere & 1.
S.N., DH4, O-BARI, Brussels-London, 12.24-15.46, G.M., 1, Delzenne.
M.A., Breguet, F-CMAC, Paris-London, 12.47-17.10, G.M., 3, Briere.
K.L., Fokker, H-NABJ, A'dam-London, 16.38-19.23, G.M., 1, Olley.

#### MAY 21st:

K.L., Fokker, H-NABL, London-A'dam, 10.00—. G M., 1, Holmes.
M.A., Breguet, F-CMAC, London-Paris, 13.55-16.35, G., 1, Briere.
S.N., DH4, O-BARI, London-Brussels, 14.45-17.20, G.M., 1, Delzenne.
M.A., Spad, F-ACMD, London-Paris, 16.17-18.40, Nil, 3, Rauge.
I.L., Bat, G-EAPK, London-Paris, 18.20-20.55, Nil, 1, Powell.
M.A., Spad, F-ACMD, Paris-London, 11.05-13.29, G.M., 4, Rauge.
I.L., DH18, G-EARO, Paris-London, 11.07-13.35, Nil, 8, Chattaway.
S.N., DH9, O-BIEN, Brussels-London, 11.49-14.12, G.M., Nil, Sahnovsky.
M.A., Breguet, F-CMAA, Paris-London, —15.09, G.M., 1, Delage.
M.A., Breguet, F-CMAB, Paris-London, 12 58-15 38, G.M., Nil, Donileun.
K.L., Fokker, H-NABN, A'dam-London, 14.20-17.20, G.M., Nil, Hofstra.
G.E., Goliath, F-GEAC, Paris-London, 13.05/20-17.20, G., 7, Bechler & 1

#### MAY 22nd:

G.E., Goliath, F-GEAC, London-Paris, 12.10-14.47, G. 1, Bechler & 1.
I.L., DH18, G-EARO, London-Paris, 12.15-14.55, Nil, 4, Chattaway.
I.L., Bat, G-EAPK, Paris-London, 14.35-17.12, Nil, Nil, Powell.

### The Air Port of Cricklewood.

#### MAY 16th:

H.P., HP, G-EATN, Paris-London, 11.10-14.45, Nil, 8, McIntosh & 1.
H.P., HP, G-EATM, Paris-London, 11.20-14.50, Nil, 10, Rogers & 1.

#### MAY 17th:

H.P., HP, G-EATK, London-Paris, 11.50-14.35, G.M., 7, McIntosh & 1.

#### MAY 18th:

H.P., HP, G-EATK, Paris-London, 11.15-14.50, G M., 11, McIntosh & 1.

#### MAY 19th:

H.P., HP, G-EATM, London-Paris, 12.00-15.17, G.M., 5, Wilcockson & 1.

#### MAY 20th:

H.P., HP, G-EATM, Paris-London, 11.00-14.19, G., 10, Wilcockson & 1.

#### MAY 21st:

H.P., HP, G-EATN, London-Paris, 11.55-15.15, G.M., 10, Perry & 1.
H.P., HP, G-EATK, London-Paris, 12.00-15.20, G., 10, McIntosh & 1.

#### MAY 22nd:

NIL.

### Inland Flying at Cricklewood.

May 16th-17th.—Nil.
May 18th.—R.A.F Bristol from Henlow return (Hope).
May 19th.—R.A.F. Bristol from Henlow return (Hope).
May 20th-22nd.—Nil.

### Inland Flying at Croydon.

May 16th.—S.F., Avro joy-rides (Muir and Tebbitt); L.A., Avro Torquay return (Hayns); B.M., 2 D.H.6s. from Brentwood to Isle of Wight (Dean and Dalton).

May 17th.—S.F., Avro joy-rides (Muir).

May 18th.—I.L., Bat, Test (Barnard); S.F., Avro, joy-rides (Muir).

May 19th.—S.F., Avro joy-rides (Muir); I.L., Vimy test (Barnard).

May 20th.—S.F., Avro joy-rides (Muir); I.L., Vimy test (Barnard).

May 21st.—S.F., Avro joy-rides and Stag Lane return (Muir); I.L., D.H.18 from Stag Lane (Barnard).

May 22nd.—S.F., Avros, joy-rides (Hayns and Muir); L.A., Leatherhead return, Avro (Ortweiller) I.L., Vimy, Maidenhead return (Barnard).

### Air Port Statistics.

#### CONTINENTAL.

Machines, 75; Passengers, 230; Crews, 90; Total Personnel, 320.

### The London Terminal Aerodrome.

The chief amusement this week was the sinking of a 3,000-gallon petrol tank on the aerodrome near the public enclosure. The mechanism for this purpose was apparently designed by Mr. Heath Robinson. The tank should be in working order this week.

On Wednesday evening the once familiar but now reminiscent Sopwith "Pup" flew over the aerodrome The morning mystery of the Bristol which crosses the aerodrome every day quite low down remains unsolved. Not that anyone has tried to solve it.

The Leatherhead Aviation Services have finished their joy-riding season at the aerodrome for the present, but on Sunday Mr. Chapman arrived on his Avro, piloted by Mr. Ortweiler, to watch the flying.

The Breguets had some bad luck over the week end, one machine was slightly damaged on Saturday in landing and another got blown into the hedge on the southern side of the aerodrome on Monday. In consequence the 16.00 hrs. service had to be cancelled on Monday.

The "Goliaths" again have been carrying big loads. M. Favreau's landings have recently been a real joy to watch. The way he handles this huge machine, and, in particular, his excellent judgment, has excited much comment.

Work has been started on a mooring mast on the old aerodrome. There are rumours of the early arrival of an airship at the aerodrome before the mast is completed.

The waiting place for cars has been enlarged and the hedge which separated the old and the new enclosures has now been demolished.

M. Bouderie joins the ranks of the Benedicks on Saturday week. If he has as much success in married life as he has had with his "Goliaths" he should not go far wrong. By way of maintaining the *Entente Cordiale* he is marryng a British wife.

### The Instone Air Line.

The "Vimy" and the D.H.18 have been on the service during the week, mostly with full loads. The firm are now allowed to run an extra week-end machine, so Mr. Chattaway took over the "18" on Sunday, returning this week.

On Saturday evening Mr. Powell went over on a special trip in the "Bat" to take a doctor to perform an operation on a lady there. The machine returned on Sunday. On Monday of this week the patient required another doctor, so the "Bat" was again requisitioned, Mr. Barnard being the pilot. Doubtless on recovery the lady will be delighted to receive the bill for two special machines to Paris.

The new D.H.18 from the De Havilland Aircraft Company arrived on Saturday from Stag Lane, piloted by Mr. Barnard. She is to make her maiden trip to Paris to-day, Wednesday. Her registration marking is G-EAWO, and she is to be called the "City of Brussels." Doubtless she will have to undergo various artistic alterations before she reaches the "paintworthy" standard of the I.A.L. By the way, it is untrue to state that the Instone Air Line has been merged in Reckitts, though to the casual eye there might be some foundation for so thinking.

The new machine has various notices in it telling passengers to fear nothing and to run races up and down the cabin to their hearts' content. It does not, however, give them any guarantee that the pilot will not hit them all over the head with a hatchet after landing for upsetting his controls.

### The Surrey Flying Services.

On Wednesday, Mr. Muir took two passengers for an hour's flight on the Avro. They went over Brooklands, Staines, Hampton Court, and the West End, going up to a height of 8,500 feet.

The following day he took up a delightful young lady of about seventeen, who has already made several flights. On this occasion he took her for some spins, rolls, loops, falling leaves, etc. The lady in question appeared to be delighted.

There were very few joy-riders on Saturday in spite of the weather. Mr. Muir took Mr. Barnard over to Stag Lane, where the latter picked up the new D.H.18.

On Sunday Mr. Muir, with Mr. Hayns, who is now flying for the S.F.S., took up a large number of passengers, including Air Vice-Marshal Brooke-Popham, who had a quarter of an hour's flight in the morning and then came back and had another for half an hour in the evening, on each occasion "with friend," as the illustrated papers say.

On Monday this week the Avro-Avro G-EAWI had its engine taken down for cleaning, so that with only one machine in action Mr. Muir had to refuse a couple of special trips, one to Newcastle and the other to Paris.

### The Flying Dutchmen.

The Fokkers have been going steadily during the week. They seem to make a habit of importing really ravishing specimens of feminity. Doubtless they export the reverse type on the 10.00 hrs. service. One has never been up in time to see this, but one presumes it is still dark then

From June 1st there will be a twice daily service each way, the extra machine leaving Amsterdam at 10.00 and the other leaving Croydon at 14.00.

On Thursday Mr. Hinchcliffe arrived from Dortmund on a D.H.9, having there picked up a passenger who had flown thither from Berlin. Mr. Hinchcliffe, after a short rest at Croydon, returned to Amsterdam, completing the double trip successfully.

In the Fokker there is a dial operated by the pilot which registers in the cabin the name of the town over which the aeroplane is passing at the time. One is glad it is on a dial and not worked direct by the voice, otherwise on bumpy days the passengers might hear the pilot say worse things than "Zeebrugge."

There is now a sort of "towel-horse" arrangement to prevent passengers from walking into the airscrew.

Mr. Leverton tells me that he has applied for A.I.D. inspection similar to that given to British machines, and he has licensed British ground-engineers looking after the machines this end, so that this will ensure K.L.M. machines being up to the British standard.

The pilots are now making beautiful slow landings with the Fokker, Mr. Cyril Holmes being the outstanding example.

G. D.

## Brooklands.

### Visiting Aviators.

Several people have inquired recently whether it is possible to go to Brooklands by air on the occasion of motor race meetings. Colonel F. Lindsay Lloyd, who is, so to speak, the power-plant of the Brooklands Automobile Racing Club, states that the aerodrome is still in the hands of the Disposal Board, Ministry of Munitions, and that consequently the B.A.R.C. has no control of aeroplanes landing there, and therefore cannot make any arrangements for the convenience of visitors arriving by air. He says, however, that when the aerodrome is again under control of the B.A.R.C. people will certainly be encouraged to use the aerodrome.

One assumes, therefore, that there is nothing to stop any aeroplane from alighting at Brooklands, and apparently the Disposal Board has no established scale of landing fees for machines arriving casually at former R.A.F. aerodromes. Naturally pilots using any such aerodromes would have to take their own chances of uncut grass and other obstacles to progress on the ground.

Visitors arriving at Brooklands by air can reach the paddock and other enclosures from the aerodrome by the road leading from the flying ground to the paddock, and on arrival at the gate leading to the paddock they would be charged 15s. each for admission on race days, which is precisely what they would pay for arriving by car.

## Coventry.

### A Choice of Evils.

For the benefit of civilian aviators traversing the Midlands of England it is well to make known the fact that the R.A.F. aerodrome at Coventry is closed and is being gradually dismantled. It is possible to land but there is no accommodation unless the aviator himself is prepared to push his machine into an empty shed, where it may be damaged by any casual visitor.

The aerodrome which used to be the testing place of the apparatus built by the Daimler Company, when that firm was making money out of aircraft contracts and before it endeavoured to do so out of the Aircraft Manufacturing Co. Ltd., is still in working order, but at the present moment it is being used for the accommodation of a brigade of the Warwickshire Defence Corps.

## Leatherhead.

Mr. W. G. Chapman of Leatherhead intimates that he is retiring from Civil Aviation so far as running joy-rides as a business proposition is concerned. Doubtless Mr. Chapman has come to the conclusion that with the increased use of road transport, thanks to the railway strike, it is more profitable to devote his time entirely to the motor trade.

Undoubtedly Civil Aviation owes a debt of gratitude to Mr. Chapman for having started running his aeroplanes immediately after the outbreak of Peace, and having kept them going in spite of difficulties for so long. It will be always to his credit that he was the first owner of civilian aeroplanes to make a regular feature of low priced pleasure flights at the London Terminal Aerodrome.

Mr. Chapman intimates that his present machines, the D.H.6 and the Le Rhône Avro are for sale and both are in excellent condition. He is willing to sell them at a reasonable price, but if purchasers do not materialise he will probably keep one of them at any rate for his own personal use, as he finds that what with bad railway services and congested roads an aeroplane is undoubtedly the handiest way of getting across country.

## THE BRITISH REGISTER OF AEROPLANES

The following additions have been made during April, 1921:

No. 645.—G-EAWP, Channel flying-boat, Siddeley "Puma," 240 h.p., Supermarine Transport Works.

No. 646.—G-EAWQ, Bristol Coupé Tourer, Siddeley "Puma" 230 h.p., Bristol Aeroplane Co., Ltd.

No. 647.—G-EAWR, Bristol Tourer, Siddeley "Puma," 230 h.p., Bristol Aeroplane Co., Ltd.

No. 648.—G-EAWS, P.9, R.A.F. 1a, 90 h.p., Boulton and Paul, Ltd.

No. 649.—G-EACZ, Sopwith "Scooter," Clerget, 130 h.p., H. G. Hawker, "Ennadale," Hook Road, Surbiton.

No. 650, G-EAWT, D.H.6; No. 651, G-EAWU, D.H.6; No. 652, G-EAWV, D.H.6; all Curtiss OX.5, 90 h.p., Brompton Motor Co. Ltd.

## AN ERROR IN THE FOURTH DIMENSION.

In the report of a county cricket match one noticed the following in an evening paper: "L. R. Tait b Cox 31."

One hopes that it is not one of the effects of his recent illness which has caused the holder of the British speed record to split himself up and play on different sides.

The second innings was even more involved as L. R. Tait having scored 91 changed the spelling of his name to Tate and bowled himself on the strength of it.—G. D.

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## AIR LAW CURIOSITIES IN AMERICA.

Owing to the fact that the United States of America possesses no unified control over the multidinous aerial activities of that country, so far as commercial aviation is concerned, the running of any flying venture or service rests entirely with the firm or individuals concerned and with the town or State wherein the operations are carried out. The uniform licensing of pilots, the issuing of airworthiness certificates and ground organisation, so far as it is officially concerned, is more or less unknown, although so far as landing grounds are concerned the U.S. Army Air Service, the Post Office authorities, municipal and private enterprise have done splendid work. That some sort of Federal legislation is required is instanced from the following examples of local legislation governing aviation, which are published in *Aviation* for May 9th.

The oldest air regulation, that of Kissimmee, Fla., which dates from July, 1908, states that no provision is necessary for the registration of a machine of any kind, but that permission must be obtained from the Council for the maintenance of an "airship" shed, barn, garage, station, depot, etc. The annual licence tax for each place of business as above is 100 dollars, and the annual licence imposed on all "airships" kept or used for hire is as follows :—Balloons (stationary), 20 dollars; ditto (powerless) (?), 30 dollars; dirigible, 50 dollars; aeroplane, 100 dollars; helicopters, 150 dollars; ornithopters, 200 dollars; all other types, 300 dollars. Increase 10 per cent. for 5-15 passengers; 20 per cent. for 15-30 passengers; 35 per cent. for 30-60 passengers; 50 per cent. 60-100 passengers; 100 per cent. for 100-500, 20 per cent. for 500-1,000, and 400 per cent. for 1,000 and over.

Penalties for the infringement of any of the regulations formulated by the Council to be not more than 500 dollars or imprisonment in the "town calaboose" for not more than 90 days, or both.

The minimum altitude to be flown at a speed greater than 8 m.p.h. is 10 feet or within 20 feet, and so on up to within 500 feet at over 100 m.p.h.

All such balloons or airships shall be properly equipped with, and shall use, "bells, whistles, or horns, brakes, lights, and other signalling and controlling apparatus, nets, parachutes, flying belts, artificial wings and other safety apparatus" as prescribed by the U.S. Government.

Finally it is unlawful to drop articles or collide with telegraph and telephone poles, etc.!

It is not surprising that no firm has endeavoured to carry on business in Kissimmee, not so much on account of the possibility of being incarcerated in the "local calaboose" for 90 days for colliding with telegraph poles, etc., but because of the prohibitive fees necessary to running a joy-ride concern with, let us say, a 1,000-passenger ornithopter, complete as fitted with bells, horns, nets, artificial wings, flying belts, etc.

In the territory of Hawaii and in the city of Newark, N.J., operators of aircraft must have a licence issued by the Federal Government. As the Government does not issue certificates to civilian pilots, consequently it is illegal to fly in Hawaii or Newark, N.J. Similarly in Nutley, N.J., a parachute descent within the limits of the local jurisdiction calls for a fine of 25 dollars for the first offence, with 30 days' imprisonment for every successive violation.

That such legislation should be in force at the present time is surely sufficient evidence that some form of Federal air regulation is absolutely essential. That this was urged in President Harding's address to Congress shows that he, at any rate, realises that by providing competent pilots, safe aircraft and the necessary ground organisation all governed by one authority, Federal air legislation will hasten the development of commercial aviation.

If one excepts the U.S. Mail Service, which is run in its entirety by the Post Office Department, there is very little doing in the way of regular air lines, with perhaps the exception of the Florida—Key West flying-boat service, which by operating over the sea does not concern itself with any pettifogging little one-horse township. So long as a pilot in flying from one town or State to another is liable to break the rules of one in endeavouring to abide by the regulations of another, then very little enterprise can be expected from anyone endeavouring to open up transport lines that could compete with such antediluvian methods of transport as exist, even at the present day, in the best countries.—L. B.

No. 54.

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## PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of The Aeroplane. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]

### Deaths.

CARR AND ARMSTRONG.—Flying Officer J. H. T. Carr and Aircraftsman I. Armstrong were killed while flying at Fort Grange Air Station Gosport, on May 20th. Mr. Carr was in the R.N.A.S., and was shot down on a "Camel" at Dunkirk. He spent a year or so at Holtzminden. and on his return to England after the Armistice bought two D.H.6s. and flew at Southwold. Later he transferred them to the Cambridge School of Flying and after the dissolution of that firm he rejoined the R.A.F.

HUDSON.—On May 20th, at Wenhaston Grange, Halesworth, Suffolk, Frank Hudson, late Captain, R.A.F., of Beckenham, in his 61st year.

PERSHOUSE.—On May 4th, killed whilst flying at Lindenthal, Cologne, Flight Lieut. Geoffrey Bradney Pershouse, N. Staffs Regt, attached R A.F., only son of the late Henry Clifden Pershouse and Mrs. Pershouse, Clifton, Bristol, aged 23.

SANTONI.—On April 29th, at Milan, after a long and painful illness, the wife of D. Lorenzo Santoni, of 72, Rue La Boétie, Paris.

SINCLAIR.—At 45, Brompton Square, S.W., Major F. C. H. C. Sinclair, late R.A.F.

STEPHENSON-PEACH.—On April 23rd, at Military Hospital, Karachi, India, of pneumonia, Flight Lieut. William George Stephenson-Peach, elder son of the late W J. Stephenson-Peach, Great Malvern, and Mrs. Stephenson-Peach, at 49, Leinster Square, London W., aged 33 years.

### Marriages.

BILES—POMROY.—On April 27th, at St. John's, Ranmoor, Sheffield, by the Rev. J. R. Lee Nicholls, Flight Lieut. G. W. Biles, D.F.C., Royal Air Force, to Mary Beatrice, only child of the late Mr. and Mrs. F E. Pomroy, and niece of Mr. W. F. Spafford and of the late Mrs. Spafford, of Sheffield.

LUCAS—HARDS.—On June 1st, at St. Mark's Church, North Audley Street, W.1. F/O Leslie Gordon Lucas, younger son of Mr. John Lucas, late of Nostell, near Wakefield, to Ethel Florence, youngest daughter of Mrs. H. A. Humphrey, of "Elmcroft," Old Road, Wateringburn, Kent. The ceremony was conducted by the Reverend M. Mayne.

SMITH—BERRY.—On May 11th, at Grantham, Wing Commander Sidney Smith, D.S.O., R.A.F., to Winifred, only child of Major H. Poole Berry, of Grantham.

### Engagements.

BUXTON—D'COSTA.—The engagement is announced between Flt. Lieut. Vincent Buxton, O B.E., Royal Air Force, late the Leicestershire Regt., only son of Mr. and Mrs. W. H. Buxton, of "Bryn Coed," St. Asaph, North Wales, and Violette Gladys, elder daughter of Mr. and Mrs. Alfred H. D'Costa, of "Asgarth," Jamaica, and 2, Montagu Mansions, Portman Square, W.1

DAMPIER—WEBB.—The engagement is announced between Flying Officer E P. Dampier, R.A F., Felixstowe, son of Mr. and Mrs. W. C. Dampier, of Gillingham, Kent, and Muriel, elder daughter of Mr. and Mrs. Arthur Webb, of Altnacealgach, Colchester.

DE HAVILLAND—SWABY.—An engagement is announced between Major H. de Havilland, D.S.O., M.C., youngest son of the late Rev. Charles de Havilland, rector of Crux Easton, Berks, and Mary P. Swaby, daughter of the late Dr. W. P. Swaby and Mrs. I. de Solla, of Madrid.

GRINNELL-MILNE—LA LANNE.—The engagement is announced between Flt. Lieut. D. W. Grinnell-Milne, M C., D.F.C., R.A.F., younger son of Mr. and Mrs. G. Grinnell-Milne, of 23, Ennismore Gardens, S.W., and Miss F. W. La. Lanne, daughter of the late Mr. and Mrs. F. D. La Lanne, of Philadelphia. Pa., U.S.A.

NICHOLL—GEDGE.—The engagement is announced between William Greville M. Nicholl, R.A.F., third son of the late Mr. William Nicholl, F.R.A.M., and Sydney Jessie, only child of the late Mr. Cecil B. Gedge and Mrs. Gedge, of Bracondale, Strawberry Hill.

THOMSON—CAYLEY.—The marriage arranged between Squadron Leader J. H. Thomson, O.B.E., R.A.F., Coastal Area Headquarters, W.C.I., and Miss Octavia Cayley, 38, Thurloe Place, South Kensington, will take place on June 16th.

### Births.

COMPER.—On May 19th, at 59, Michael's Road, Aldershot, Hants, to Phyllis, the wife of Flying Officer N. Comper, R.A.F., a daughter.

GORDON-DEAN.—On May 13th, at Inglesby, The Bishop's Avenue, N.2, to Helen, wife of Sqdn. Ldr. H. Gordon-Dean, R.A.F.—a daughter.

GRABOWSKY-ATHERSTONE.—On May 7th, at Bairnsdale, Victoria, Australia, the wife of N. Grabowsky-Atherstone, A.F.C., late Lieut., R.N.—a son.

REILLY.—On May 14th, at Penerley Farm, Beaulieu, to Isabel (nee Hathorn), wife of Squadron Leader H. L. Reilly, D.S.O.—a son.

WRIGHT.—On May 16th, at 4, Wessex Gardens, Golders Green, to Winifred (nee Cowles), wife of Squadron Leader M. Wright, R.A.F.—a daughter.

## SOME HUMOURS OF THE R.34 AFFAIR.

A dweller in Yorkshire writes:—

"Some time ago I went over to Howden to see the wreck of the R.34. It was a wreck all right. It was some 300 yards across open ground from the road. Might I go over and look at it? No, the sentry said I might not. Which was a reasonable thing if there had been a crowd near instead of two women, a dog and myself. At that moment a brass-hat came by in a service car with a host of civilians of various sexes piled up on it. He had apparently been showing them what he *could* do with a sky-lorry.

"It was too dark for a photo, but I just fished out my camera to see how things looked in a view-finder. A sentry, with a sort of Humane Society expression, interposed his body heroically between the camera and 'Reck 34.' Luckily the camera didn't go off. But did you ever hear such drivel? Imagine what a loss the nation would suffer if I smuggled into a photo album (or even a daily paper for that), a photo of one (obsolete) gas bag completely bent.

"But I heard an account of the crash. It appears that the airship was flying in East Yorkshire at 1,200 feet along a valley, when the heavy wind drifted it onto the hills and broke some pieces. The discovery of 1,200 feet hills in that neighbourhood should be communicated at once to the Geographical Society.

"My own opinion is that this crash, like the eruptions of Vesuvius and the Aurora Borealis, was due entirely to a diabolical Sinn Fein plot, to induce the airship to fall on a policeman. How else can one explain the coincidence of a 40-knot gale and a 1,200 foot hill arising together?

"Still, as the official report says, the ship was about a year old and therefore quite obsolete, was only used for instruction, and only cost quarter of a million; so why worry?

"I rather imagine that the facts of the crash, together with the absence of a mooring mast, might be very interesting."

## AN ERROR OF JUDGMENT.

An American woman named Laura Bromwell is reported to have looped the loop 199 times on May 15th at Mineola, Long Island. What adequate reason she had for doing this is not stated, but the performance is claimed as "a world's record for a woman flier," though such records are not recognised. It is stated that she started at 8,000 feet and looped to within 400 feet of the ground. She seems to have made a mistake in omitting to loop for a further 400 feet.

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## INDEX TO ADVERTISERS

| | |
|---|---|
| Accles & Pollock, Ltd. | *Back Cover* |
| Aircraft Disposal Co., Ltd., The | 493 |
| Arrol-Johnston, Ltd. | *Front Cover* |
| Auster, Ltd. | *Front Cover* |
| Beardmore Aero Engines, Ltd., The | *Front Cover* |
| Bray, Gibb & Co., Ltd. | 495 |
| Bristol Aeroplane Co., Ltd. | 480 |
| Brown Brothers, Ltd. | 494 |
| Cunard Line | 496 |
| De Havilland Aircraft Co., Ltd., The | 493 |
| Fairey Aviation Co., Ltd., The | 475 |
| Firth, Thos., & Sons, Ltd. | 490 |
| Imray, Laurie, Norie & Wilson, Ltd. | 496 |
| Instone Air Line | *Front Cover* |
| Napier, D., & Son, Ltd. | 477 |
| Naylor Brothers (London), Ltd. | 495 |
| New Pegamoid, Ltd. | 496 |
| Nieuport and General Aircraft Co., Ltd. | 490 |
| Roe, A. V., & Co., Ltd. | *Inside Front Cover* |
| Rolls-Royce, Ltd. | 479 |
| Rubery, Owen & Co. | *Back Cover* |
| Sankey, J. H., & Son, Ltd. | 494 |
| "Shell" Marketing Co. | 483 |
| Sunbeam Motor Car Co., Ltd. | 485 |
| Supermarine Aviation Works, Ltd., The | *Back Cover* |
| Titanine, Ltd. | *Front Cover & Inside Back Cover* |
| Vickers, Ltd. | 487 |

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## ON SUBSIDIES AND CIVIL AVIATION.

Certain questions which were asked in the House of Commons on May 24th and the answers thereto make it necessary to raise once more the much-vexed question of Subsidies in relation to Civil Aviation.

These questions and answers were as follows :—

Mr. Raper asked the Secretary of State for Air whether the present subsidy to British air lines is confined to one machine per day in each direction and if so whether this limiting of the services results in the turning away of would-be passengers?

Captain Guest.—The present subsidy is designed to assist the running of two machines in each direction each day, but there is no restriction against the firms operating additional machines without subsidy. The lack of sufficient suitable machines, however, has hitherto limited the service to one machine in each direction each day, except on special occasions, and as a consequence of this shortage and of the expansion of the traffic, would-be passengers are being turned away.

Mr. Mills.—Has this any relation to the increased cost of the postal service?

Captain Guest.—No, Sir, we have no contract with the Post Office.

Captain Terrell.—Is the Right Hon. Gentleman aware that the passengers turned away by British companies are being carried by the French companies?

Captain Guest.—Yes, Sir.

### An Extraordinary Position.

Captain Guest's first answer discloses a most extraordinary state of affairs. Apparently the two British air lines which are operating to-day, namely, the Instone Air Line and Handley Page Transport Ltd., are each entitled to draw the subsidy on one machine in each direction every day. This would mean each line running seven machines per week in each direction, or, in all, twenty-eight (28) British machines per week crossing the Channel on the London-Paris air route.

Instead of doing so these lines run on alternate days only, and on six days a week only. So that in fact only twelve (12) British machines cross the Channel per week on the London-Paris route, except on special occasions such as during the Whitsun Holidays when two machines were run on certain days, or when some wealthy person charters a special machine which runs without the subsidy.

To put the facts in another form, to make the matter still clearer, the Instone Line send one machine to Paris on Mondays, Wednesdays and Fridays, which machines return on Tuesdays, Thursdays and Saturdays. Handley Page Transport Ltd. send one machine to Paris on Tuesdays, Thursdays and Saturdays, which machines return on Mondays Wednesdays and Fridays

It has always been believed, since the subsidy arrangement came into force, that these two lines were tied down by the Air Ministry to this limited service, and that if any extra machines were sent they would have to fly without the subsidy. Yet here we have the distinct statement by Captain Guest, speaking officially as Secretary of State for Air, that "the present subsidy is designed to assist the running of two machines in each direction on each day." Which means four machines per day, or twenty-eight per week.

### Spoiling the Child.

The second part of Captain Guest's reply indicates that he is at any rate very kindly disposed towards our two air lines, for instead of laying on them the blame for running only twelve machines a week when they ought to run twenty-eight he went out of his way to make excuses for them by ascribing the feebleness of the British cross-Channel service to "lack of sufficient suitable machines."

It is, in a way, eminently satisfactory to see that our new Air Minister is disposed to be tender to the shortcomings of youth. It is evidence that he is in sympathy with those who are trying to build up Civil Aviation and that he is sincerely interested in the progress of British Aeronautics. But there are times in the youth of every child when sympathy may be wasted and when a certain measure of severity is necessary in order to guide the child in the way it should go. This seems to be such a time in the youth of Commercial Flying. Therefore let us examine the facts.

Last year it was not at all unusual for Handley Page Transport Ltd. to run two machines a day in either direction between London and Paris, and there was always at least one machine in each direction. Some of those machines may have been crashed, but there are several still in existence and there are certainly many brand new Handley Page machines and many hundreds of brand new Rolls-Royce engines in the hands of the Aircraft Disposal Company Ltd. which could be adapted at small cost and in a very short time for use on the cross-Channel service.

Therefore one fails to see how there can be any lack of suitable machines of this type, assuming that those which were in use last year were suitable, as one may assume that they were and are seeing that a few of them constitute the whole matériel of the Handley Page service this year.

As regards the Instone Line, they have an excellent Vickers "Vimy" with newly installed Rolls-Royce engines of the latest type and they have two D.H.18s with Napier "Lion" engines, which are at present the last word in passenger aeroplanes, and they have a B.A.T. with a modern Rolls-Royce engine. Of these the D.H.18s ought to be able to pay their own way without any subsidy at all, if efficiently operated, and the "Vimy" and the B.A.T. could certainly show a profit with the help of the subsidy.

Here then are four thoroughly good machines available with which to make only fourteen trips per week in order to earn the full subsidy. Instead of which they only make six trips per week. Which is obviously absurd. So one cannot plead that there is any lack of suitable machines in this case.

### Maximum Plant and Minimum Work.

The apparent lack of suitable machines, for there is obviously no real lack of machines, seems to arise simply and solely from the fact that neither of the air lines makes a real effort to get the maximum amount of work out of either their machines or their pilots.

An inspection of the Continental Arrivals and Departures table which is published week by week in this paper shows that it is quite unusual for one machine or one pilot to fly over the London-Paris route in either direction more than four times in one week. And if either a machine or a pilot does the journey as many as four times in one week it or he probably only does it twice the next week or not at all.

Now as the slowest machines take about three-and-a-half hours over the 240 miles between Paris and London and the fast machines take about two hours that means that at most, with four trips per week, the machine or the pilot does fourteen hours' work per week and very probably only eight hours, even in a four-trip week. And in a week in which a machine or pilot only goes to Paris and back once the whole week's work may only amount to four hours' flying.

Such working hours as these are beyond even the wildest dreams of the most ardent Trades' Unionist. When regarded as a business proposition by anybody who hopes to make Civil Aviation a commercial success they simply represent the summit of craziness or the depths of imbecility. Any attempt to bolster up such methods with the taxpayers' money paid out in the form of a subsidy is a financial crime on the part of the Air Ministry. And no possible amount of subsidy can ever make a paying business of air lines run in such a way.

One does not for a moment blame the pilots. They do excellent work, and nobody is more annoyed than they at their hours and days of long enforced idleness. All of them, one believes, would rather be paid on a mileage basis provided that they had an unlimited supply of machines to fly. And the only reason there can possibly be for their having so few machines to fly is sheer bad organisation somewhere.

It may be bad arrangement of inspection and repair and overhaul work. It may be the silly hours at which the machines are timed to start. But the fact remains that nobody can call a two-hour trip to Paris or from Paris a reasonable day's work for a D.H.18, or a three-and-a-half-hour trip a day's work for a Handley Page, or for their respective pilots.

### A Fair Day's Work.

Of course, if only one machine per day is allowed, then there is no alternative to the machine and pilot going out one day and back the next, and it does not matter what time they start. But if two machines per day are subsidised, as Captain Guest has said, then there is no reason why the same machine and pilot should not do the out-and-home journey in the day and do it four days a week. Even then the slowest machine and its pilot would only be doing 28 hours a week, which is less than the work of even a war-boom coal-miner and considerably less than many a pilot did over the enemy's lines week in week out fair weather and foul for months on end during the war.

On this out-and-home basis each machine would either do the out-and-home journey one day and stand by the next, or it could do four consecutive days and have the next three for overhaul. Barring crashes, any firm with three machines which were properly tended by skilled mechanics ought to be able to run a daily out-and-home service with unfailing regularity. And even then each machine, engine, and pilot would do very much less real work and would endure very much less strain than is endured by a London motor omnibus and its driver.

With efficient mechanical supervision two machines could ensure the service. The third should only exist as a stand-bye in case of forced landings caused by bad weather making it necessary to send out a second machine while one was on the ground somewhere along the route.

In the case of a real crash a new machine should be forthcoming immediately from the manufacturer of the particular make of aeroplane used on that particular line This would have to be the subject of an arrangement between the operator of the air line, the maker of his machines and the company with which the machines might be insured, so that a new machine would be held in stock by the makers for immediate delivery on the demand of the insurance company.

### The Purposes and Conditions of the Subsidy.

As a matter of fact, on the present basis of £75 per trip subsidy (as indicated by Captain Guest in the House of Commons on April 27th) every machine ought to have the whole of its passenger fares and freight as clear profit. In the days when Air Transport and Travel Ltd. was being properly run, albeit overweighted by an expensive staff and many inefficient machines, it was carefully calculated that a D.H.18 with eight passengers showed a clear profit on each trip, as it cost slightly less than £70 per trip even after piling onto it all its share, according to its capital value, of the dead charges and dead-heads with which the firm was cumbered. Therefore a D.H.18 or a Handley Page cannot well help making money out of the £75 subsidy even if it flies empty.

As there is such a keen demand for seats on the British cross-Channel machines it seems highly probable that they generally pay their way on their fares alone without any subsidy. Therefore it strikes one that it would pay both the existing air lines very well indeed to run three times as many machines and split the subsidy of one machine between it and two unsubsidised machines, so that all three would then pay their way.

After all, the object of a subsidy is to guarantee the recipient against loss, not to present him with a handsome profit. Some people do not seem quite clear on this point.

Meantime the actual conditions under which the Air Ministry pays the present subsidy are rather obscure, despite Captain Guest's statement to the House on April 27th, and his reply to Mr. Raper on May 24th. Therefore one suggests that it would be well to publish the actual agreement between the Air Ministry and the air line operators.

### Some Alternative Schemes.

Presumably it is fairly clear from the foregoing statements that the continuation of the subsidy on the present basis beyond the seven months to which the present agreement is limited would be the worst possible way of helping Civil Aviation. One is convinced that Captain Guest is as honestly desirous of helping Civil Aviation as is Sir Frederick Sykes and his staff in the Department of Civil Aviation. Therefore one ventures to submit to their consideration a few alternatives.

Firstly, the Air Ministry might cut off all subsidies and leave Commercial Flying to sink or swim on its merits. There are many who believe that this would be the best way of all, for the Englishman never really does his best till he is up against the apparently impossible. And those who have studied the subject know perfectly well that commercial aeroplanes can be made to pay if properly built for the job and properly operated.

Secondly, the Air Ministry might cut off all subsidies and offer in a properly becoming manner a few titles to those who will adventure their wealth in financing approved air lines. If, as has happened, wealthy men both young and old will squander tens of thousands of pounds in backing impossible theatrical enterprises for the *beaux yeux* of our Occidental equivalent of the nautch girl and the geisha, it seems not unreasonable to suppose that intelligent and ambitious men of wealth can be found who will put up a few hundreds of thousands to back such comparatively sound propositions as air lines if they have before them the certainty of a place in Debrett as a reward.

Thirdly, the Air Ministry might approve some scheme for a great National Air Transport firm, backed by the big financial interests and subsidised to the extent of a guaranteed return on its capital in return for a guaranteed minimum service per week. This would, of course, mean giving a monopoly of the subsidy to one great firm. But that would be better than having no firm at all. And it would not debar other people from starting a rival firm with better machines and better organisation if they had the pluck after the subsidised firm had spent time and money in popularising aviation and perfecting air routes.

Thirdly, the Air Ministry might rearrange the whole basis of the subsidy and work out a scheme by which the air lines would be paid for work done, instead of being paid as at present for work which is not done. For example there might be a subsidy of so much per week conditional on the service being maintained at the rate of one machine each way each day for each line (that is to say fourteen trips per firm) with the proviso that if less than ten trips were made by any firm there would be no subsidy at all for that firm.

Or alternatively the subsidy might be arranged as a percentage on the actual cost of running the machine on each trip, reckoned on the actual value of the machine based on its estimated flying life of so many hours in the air. It is absurd to base the calculations for a subsidy on running costs calculated on the capital value of the machine plus the firm's overhead or dead charges, for that is merely giving a premium to inefficiency.

Fourthly, the Air Ministry might evolve a plan for subsidising the machines themselves much as certain units of our Mercantile Marine are subsidised because of their value in time of war.

One has frequently scoffed at the idea, so popular among Members of Parliament and journalists, that a commercial air fleet can be turned into a war fleet in five minutes. Such machines cannot be of any use without an escort of fighting machines. But big passenger-carriers can be of use behind the lines as troop-carriers, ambulances, ammunition-carts, and so forth, and with an escort they might be used as bombers. Such machines would be worth subsidising for the use of the R.A.F. in time of need. In fact, the most promising passenger carriers, such as the new De Havilland monoplane and the latest "Vimys" are actually being bought by the R.A.F.

### Uncalculated Generosity.

A subsidy scheme on this basis would need rather careful financial investigation, for at anything like the present rate of subsidy to the present air lines it would mean giving each machine twice over per annum to the air line as a free gift. For example, in his speech on the Air Estimates (The Aeroplane, April 27th) Captain Guest said that each air line's subsidy was "limited" to £25,000 in the seven months.

The uncalculated generosity of this figure may be realised when one considers that it is equivalent to giving the Instone Line about ten Napier-engined D.H.18s free gratis and for nothing per annum if the Messrs. Instone will consent to run one of them in each direction per day between London and Paris and stand their own chances of picking up enough passengers and freight to pay for pilots, mechanics, repairs, fuel, and insurance for that one machine per day. Think of ten D.H.18s as a free gift from the Nation every year and you get some idea of what a pleasing proposition it would be to run an air line on those terms.

Nevertheless, if the Government is in such a generous mood it might be worth while for the Air Ministry to work on somewhat similar lines in the future. It might for example say to an existing or a prospective air line: "We will supply you free of charge with six new machines with spare engines if you will buy six yourselves, the type to be mutually approved. In return you will guarantee to run four machines a day from England and four more a day to England from the Continent. Also you will insure those machines so as to replace immediately any that may be crashed."

That would mean that the firm would have four machines in use (each doing an out-and-home trip per day) and four under inspection or overhaul and four in reserve. Thus the firm's capital expenditure would be only half what it would be if it had to buy all its own machines, and its dead charges would be reduced in that proportion. In this way the firm would have every possible inducement to get the last ounce of work out of all its machines, so as to get the greatest possible revenue out of its capital expenditure.

Then it might be arranged that for the next year the subsidy might be spent—by the Air Ministry—either in supplying new machines of an improved type or in rebuilding existing machines or in fitting new engines. But in no case should actual cash be handed over to any air line here or hereafter to be spent at its own free will.

Subsidies to the great steamship lines are paid as part of the cost of building the great liners which are earmarked to become auxiliary cruisers or hospital ships in time of war. What are called subsidies to the mail-carrying lines are actually payment for work done. But one cannot recall any steamship firm to which any Government pays hard cash just as a reward for being a steamship firm. And one cannot see why any air line should be paid simply for existing more or less gracefully as an air line.

### A Little Simple Arithmetic.

Some further idea of the utter wastefulness of the existing system may be gathered by the use of a little simple arithmetic.

Let us take it that a Napier-engined D.H.18, or its equivalent, costs £6,000 to buy. Doubtless one could buy ten or a dozen such machines at £4,500 apiece or thereabouts, but £6,000 was the market price for one such machine when last quoted.

Now two years hence that machine, or any other machine built to-day, must be written off as obsolete. Therefore even if used to the fullest extent such a machine must bear a charge of £60 per week for depreciation, if it is to pay for itself after, say, 100 weeks' running.

Under the existing subsidy system such a machine does one journey to Paris and one journey from Paris per week. Perhaps it may be two journeys each way in one particular week, but the chances are that it will be laid up altogether another week and do no journeys at all, so one out-and-home trip per week is a fair estimate. The single journey takes on an average two-and-a-half hours. That is to say the average work of the machine is five hours' flying per week.

Now five hours per week equals two hundred and sixty (260) hours per year, which equals five hundred and twenty (520) hours for the complete flying life of the machine. Call it five hundred (500) hours for simplicity in reckoning, and you get a rate of depreciation of £12 per hour, which equals £30 per trip for depreciation alone.

That is to say, if the machine carries eight passengers per trip at £6 6s. per passenger, the sum of £3 15s. per passenger has to be deducted simply and solely for depreciation. Therefore the actual money received for genuine running expenses is only £2 11s. per passenger.

And a twin-engined Handley Page with only 12 passengers is still worse. For the machine must cost more in the first place, when once the "Disposal" stock is exhausted.

Obviously any attempt to run an air line on such a system is either pure philanthropy or abject imbecility.

### What Can Be Done.

Some people say that instead of doing only 250 hours' flying per year such a machine should do at least 1,000 hours. And so good a judge as Mr. Frank Searle has said that with proper organisation each individual machine (including the reserve machines) ought to do 1,500 hours in the air per year. Personally one agrees absolutely with Mr. Searle.

In proof whereof take a week's work done by Mr. Alan Cobham, of the De Havilland Co., quite recently. Mr. Cobham went out to do some special photographic work with a perfectly standard D.H.9 and a Siddeley "Puma" engine, and here is his record for six consecutive days of what he apparently considers a fair week's work.

Monday.—London, Ipswich, Norwich, Boston, Lincoln.

Tuesday.—Hull (survey of docks), York, Stockton, Middlesborough, Sunderland, Shields, Newcastle.

Wednesday.—Shields, Durham, Harrogate, Leeds, Huddersfield, Rochdale, Bury, Bolton, Chester, Llandudno, Carnarvon, Shotwick (landed after 5½ hours in the air), Manchester.

Thursday.—Hanley, Stafford, Derby, Nottingham, Leicester.

Friday.—Nuneaton, Coventry Birmingham, Walsall, Wolverhampton, Warwick, Leicester.

Saturday.—Loughborough, Nottingham, Peterborough, Luton, London.

Photographs were taken at each place named, which entailed circling round the objective, hence the geographical distances do not appear great. But as each photograph entailed finding an exact spot on the map the work involved was far greater than straight air line flying.

The total time in the air was 26 hours, the petrol consumption was 270 gallons and the oil consumption 14 gallons. The actual distance flown was approximately 2,500 miles, and during the whole time neither the engine nor the machine was touched with a spanner. All of which shows what can be done by a trier on a reliable machine when he has the sense to leave it alone and let it do its work.

After all 1,500 hours per year only means 30 hours per week. Which only means six out-and-home trips. Which leaves one clear day per week for any big job which may be needed. Or, to put it another way, the machine should do the out-and-home journey seven days a week for six weeks (which only means 210 hours' flying) and could then have a week off for a big overhaul.

### What Ought To Be Done.

It is well to remember that five hours' flying per day leaves plenty of time for running repairs and adjustments during the twenty-four hours. If a machine leaves Croydon at 10.00 hours, arrives at Le Bourgêt at 12.30, leaves Le Bourgêt at 14.30 (as it should do) and arrives back at Croydon at 17.00 (otherwise known as 5 p.m.), both it and its pilot have done quite a moderate day's work. And the ground staff have from 17.00 till 24.00 hours that evening and from 00.00 till 10.00 hours next morning, or 17 hours in all, in which to change engines, fit new control wires, change planes and do anything else that may be necessary to put the machine in the air for its next day's work.

That is how an air line should be run, and that is more or less how the ill-fated Air Transport and Travel Ltd. would have been run if it had not been let down just when it was on the point of paying for itself. Yet in spite of all the experience gained last year, here we are to-day fooling about with air transport running a machine to Paris one day, bringing it back the next and leaving it sitting in its shed for 120 hours till it next takes the air, or else using it for "joy-rides" more or less disguised as "test flights."

Even joy-riding is preferable to sitting in a shed doing nothing, for joy-riding does at any rate tend towards what the French call the "*vulgarisation d'aviation.*" But either way of spending the time of the machine and its pilot is an unjustifiable waste of the tax-payers' money which is received in the form of a subsidy. All of which confirms the opinion which one expressed in this paper two years or so ago, when that preposterous Civil Aerial Transport Committee was sitting, namely, that Civil Aviation ought to succeed on its merits and that a subsidy, other than as payment for value received, is a very evil thing indeed.—C. G. G.

* * *

## BOLSHEVIK AERIAL DEVELOPMENTS.

Information from the Baltic States intimates that the Bolshevik Government of Russia is making strenuous efforts to build up an Air Force. In the recent war with Poland the Bolshevik armies suffered very considerably from lack of aerial reconnaissance. The Poles, on the other hand, were fairly well equipped with French and German and a very few British machines manned by French, German and American aviators, all of whom had had proper training in their respective flying services, and by some Poles who had been adequately trained when they were German or Austrian subjects.

Naturally the Bolshevik Government quickly appreciated the disadvantage of not having an Air Force of its own, hence the present efforts to raise one.

It is said that the present scheme is to raise a force with an equipment of at least 400 machines, which would mean approximately 100 machines in the field with the rest for training and in reserve. This would mean roughly five squadrons according to the British type of organisation.

Attempts have been made to obtain the necessary equipment in Sweden, but the Swedes, being practically next door to Russia, are averse to supplying such dangerous neighbours with such modern weapons of war, seeing that Stockholm itself would be within bombing distance of the Russian coast if the Russians possessed anything like efficient seaplanes or flying-boats.

The Germans have now practically no aircraft suitable for war work and in any case the Germans themselves realise that Russia under the Bolshevik Government is in fact their most dangerous enemy.

It seems therefore that the Russians hope to obtain their aircraft equipment from France or England, and it is said that a representative of a British firm has actually entered into negotiations with the Bolshevik Government for the supply of aircraft.

So far as one's personal views are concerned one regards the supply of aircraft to the Bolsheviks very much as one regards the supply of aircraft to Japan. That is to say we ought not to supply the Yellow races with weapons of war, but if we do not somebody else will do so, and therefore we may as well take their money as anyone else. There is further the excuse that although a certain number of Russians do develop into very good pilots, it seems to be practically impossible to find a Russian who is capable of maintaining any mechanical product in working order and therefore it seems that the more aeroplanes we supply to Russia, the more we are likely to help the Russians to kill themselves through the said aeroplanes falling to pieces owing to being badly maintained. Which, of course, would be all to the advantage of civilised Europe.

Apparently the Russian Bolshevik Government itself is, according to the Baltic account, holding out every inducement to foreign pilots, mechanics and designers, to go to Russia, the first class to train Russians to fly, the second class to keep the aeroplanes in order and to train Russian mechanics to do likewise, and the third class to produce machines to be built in Russia. The first class would probably succeed admirably in their task, the second class would probably achieve a moderate amount of success, but the third class would probably return heart-broken after a comparatively short attempt to build aeroplanes with slave labour, for it is known that the Russian method of conscripting labour for its factories is even a worse form of slavery than that wage slavery to which our Trade Unions object so strenuously.

Undoubtedly this latest attempt on the part of the Bolshevik Government to develop its military power along the most modern lines does indicate the steady growth of the growing peril of the Yellow Races from the East, and indicates further that anti-German fanatics in France and in this country should take a sane view in our dealings with Germany, for when in due course Russia becomes again a great military Power Germany will bear the first shock of Russian attack.—C. G. G.

## AMERICAN-JAPANESE AFFAIRS.

The following letter has been received from Colonel the Master of Sempill :—

Sir,—Will you allow me to draw your attention to a few slight errors in your article on the "Japanese-American War" in your issue of the 25th instant?

Bottom of second column :—(A) "The orders placed already in England by the Japanese Navy alone must run into some millions of pounds."

(1A) The orders placed for aeroplanes, engines and accessories do not nearly total £1,000,000.

Top of third column :—(B) "But it is currently reported that the Avro Company have about 100 training machines on order."

(1B) The Avro Company have an order for less than 50 machines.

Top of third column :—(C) "Also it is said that 40 Nieuport "Nighthawks" have been bought from the Gloucestershire Aviation Company, that 30 or 40 machines of similar type with "B.R.2" engines, slightly modified and known as the "Sparrowhawk," have been ordered, and that the same firm is to make a quantity of Nieuport "London" triplanes, a two-seater bomber with a remarkably good performance and designed for quick and cheap production."

(1C) The Gloucestershire Aviation Company have not received nor will receive any order for "Nighthawks" or "Londons," but 50 "Sparrowhawks" have been ordered.

I trust you will forgive my referring to the above point and will leave the use of the information given to your discretion.

You are of course quite entitled to hold any views you wish, but is it not a pity that in this case such should have been expressed during the visit of H.I.H. the Crown Prince of Japan, the guest of this country?

I think the effect of your article on Anglo-Japanese Aviation matters should be worth careful study.

(Signed) H. SEMPILL (Colonel).

[One desires to thank the Master of Sempill for the foregoing letter, which will give the readers of this paper an excellent basis from which to calculate the true value of the various rumours which are continually being circulated about Japanese purchases in this country It will be remembered, of course, that the figures mentioned in the original article were given purely as reports and rumours

As regards Colonel Sempill's reference to the visit of the Crown Prince of Japan to this country, one desires to state that the article was published at this moment with the deliberate intention of demonstrating to those concerned with and for the defence of the United States that there are at any rate a certain number of people in this country who are not fanatically pro-Japanese.

There is in the United States a strong section of the Press which is violently anti-English, and anything done in this country which can be interpreted as being to any degree pro-Japanese is immediately used by that section of the American Press as proof that this country is anti-American. The British Press of the past week or two has undoubtedly supplied the anti-British Press of the United States with more than sufficient material with which to demonstrate our supposed pro-Japanese tendencies. Therefore it seems necessary to provide something by way of an antidote to that particular poison.

After all the Americans are of our own blood, and are our natural Allies in time of trouble.—C. G. G.]

## BRITISH AVIATION IN JAPAN.

The following notes have been received from Japan :—

The first party of British Naval aviators who have been engaged by the Japanese Navy as instructors arrived in Yokohama on April 16th by the N.Y.K. steamer *Suwa Maru*.

The members of the British first party were Lieut.-Col. H. Meares, Major F. B. Fowler, Major H. B. Brackley, Lieut. A. L. Loton, Lieut. H. W. Crisp, and Engineer M. B. Ford. They were welcomed by high officers of the Naval Air Service at the Yokohama Wharf.

The British aviators visited the Naval Air Service and Army Air Service stations at Tokorozawa on April 21st, and observed the practice of the Army aviators and aeroplane factory.

Lieut.-Comdr. Todd, Lieut. Hills (second party of British instructors) and sixteen other expert engineers, reached Kobe from London aboard the N.Y.K. liner *Iyo Maru* on April 23rd, The sixteen experts have been dispatched from Short Bros. Aeroplane Works to spend two years in Japan, teaching Japanese workmen for the naval works how to build flying-boats of the F. No. 5 type, which were purchased recently by the Japanese Navy from England.

It is reported that the model dock and sliding platform of the Kasumigaura new naval aerodrome are already completed and the first-class of Japanese students to be trained there will consist of 20 members. They will be under the instruction of the newly arrived British aviators.

American news says that "Japan has bought aeroplanes and materials valued at 5,000,000 dollars in England, and other large quantities in France and Italy," but an authority in the Flying Bureau of Japan stated recently "It is very mistaken report, I think. Recently our Navy has engaged British aviators as instructors, and has bought several training machines, but the best proof of the fallacy of the report of the large quantity mentioned is that Japan has not enough airmen to handle them, even if she had bought them."

[The answer is that it is quicker to train aviators than to build aeroplanes.—Ed.]

The Japanese Navy has bought recently several twin-engined flying-boats from Short Bros. in England. They will arrive shortly.

## A ROYAL VISIT BY AIR.

On Sunday evening their Majesties the King and Queen of the Belgians flew from Belgium to Dover in two De Havilland aeroplanes piloted by Belgian officers. Owing to bad weather on Monday their Majesties proceeded to Portsmouth by automobile.

## THE HAMBLE ACCIDENT.

On Thursday last week Mr. Lawrence Tebbit was killed near Hamble on a Bristol "Coupé." One of his passengers, Mr. P. J. Pinckney, was also killed, and his daughter, Miss Pinckney, was injured.

The machine had been bought from the Aircraft Disposal Company by Mr. Pinckney, who was a ranch owner. Mr. Tebbit had been flying the machine at Croydon during the week and set out from the aerodrome on Thursday morning to fly to Hamble, where Mr. Pinckney intended to buy some Avros.

As they came in sight of Hamble the engine was heard to be "popping" and so apparently Mr. Tebbit decided to land short of the aerodrome in a big field. He cleared some trees on the edge of the field, but found another row in front of him. He seemed to try and open up the engine again to clear these, but without success, for the machine stalled and nose-dived. Mr. Pinckney was killed outright and Mr. Tebbit died later in hospital.

Lawrence Tebbit was just over 21 years of age and lived at 17, Earl's Court Square. He was a pilot with Aircraft Transport and Travel Ltd. practically from the beginning of that service and prior to that was a pilot in the R.F.C. and R.A.F. He made numerous flights with A.T. and T. until that service closed down last December. After the cessation he was sent across to fetch back the last machine from the Paris end.

Quite recently he had been flying an Avro at Croydon for the Surrey Flying Services and a few days ago he took a D.H.6 to the Isle of Wight for the Brompton Motor Company.

He served in a Sopwith "Camel" squadron during the war, where he was considered to be a very able aviator. On taking up Civil Aviation he developed into a really sound and careful pilot and the fact that in the early days of civil flying he was one of that little band of pilots who helped to establish that long unbroken record of London-Paris flights throughout the winter of 1919-20 is in itself sufficient example of his worth as a pilot, his *esprit de corps,* and his determination.

In Lawrence Tebbit, as in the loss of his friend Andrew Forson, civil aviation has lost another pioneer which it can ill spare.—G. D.

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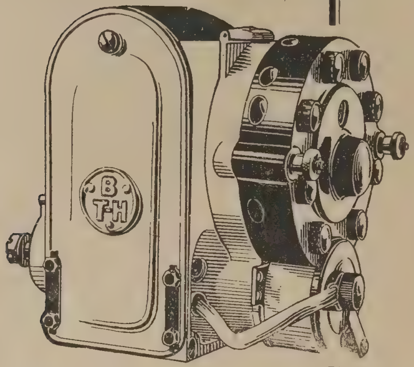

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## THE WEEKLY COMMENTARY.

The third of the series of articles "On Variable and Other Wings" which appears below deals with the variable surface and with the Handley Page types of wing. In regard to the variable surface type the very large variation in surface needed to give useful results introduces very serious difficulties, and such particulars as are available of the only example of such a wing yet built and flown show that it does not compare in efficiency with the well-tried variable camber flap type of wing.

The article is followed by a note, based on a communication made by Mr. C. R. Fairey, which throws further light upon the subject of variable camber wings generally.

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A very interesting and novel type of two-engined machine, now under construction at the Zeppelin works at Lindau, is described on page 508. This machine is due to that very unconventional designer, Herr Dornier.

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Italian aeronautical enthusiasts have displayed a large interest in the problem of the very small low-powered type of aeroplane. The conditions of the competition for the Luigi Mapelli Challenge Cup—which appear in this issue—call for aeroplanes with a cylinder capacity less than that of a standard 3½-h.p. motor cycle. Actually this means a maximum power developed of not more than 8 to 10 h.p.

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In connection with small aeroplanes the little Czecho-Slovakian monoplane which carries pilot and passenger with a 35-h.p. engine is of some interest.

## ON VARIABLE AND OTHER WINGS.—III.

The wing of variable surface has for long been a favourite subject for the activities of those inventors who hope to revolutionise aviation, and many proposals for expanding, contracting and folding wings have been made, many of them ingenious, but few of them having any value whatever.

The general object of the variable surface inventors is identical with that more or less successfully achieved by the variable camber devices which have already been discussed—i.e., it is to combine a low landing speed with a high top speed, this top speed being attained by the use of a high wing loading, as in the case of the variable camber wings.

### Variable Surface v. Variable Section.

But, instead of converting the wing into one of the high lift type for landing, the alternative of reducing the loading by increasing the effective surface of the wings is to be adopted, generally without any alteration in the form or qualities of the wing section used.

The great difficulty which has to be overcome is due to the very large change of surface which is needed to secure any useful results. Assuming that one proposes to use for high speed purposes a loading of 10 lb. per sq. ft. on a wing such as R.A.F.15. The landing speed will then be of the order of 65 m.p.h. By using variable camber gears one may bring this landing speed down to about 50 m.p.h. for the same loading.

### The Change of Surface Necessary.

But if one proposes to reach the same low speed without altering the section of the wing, the loading will have to be reduced to a little under 6 lb. per sq. ft.—that is, the surface necessary for a given total weight must be increased in the ratio of 10 to 6—an increase of 66 per cent.

That is to say, for a variable surface wing to produce results of the same magnitude as those which can be achieved by a variable camber gear, it is necessary that the machine shall carry about with it 66 per cent. of extra wing surface, together with mechanism for packing that 66 per cent. of wing away when it is not needed, and unpacking it and supporting it when it is needed for landing or climbing purposes.

It scarcely needs argument to show that the variable surface wing must be very much heavier than the variable camber wing which will give the same speed range.

But there are possibilities of combining variable camber with variable surface and so gaining a still greater speed range. Suppose that the imaginary variable surface wing, when it increases its surface by 66 per cent., also increases its camber. Suppose this camber change to be as effective as the flap camber change gear. Then one may load the wing to 10 lb. per sq. ft. extended, still giving 50 m.p.h. landing speed, and when the wing is closed the loading will rise to 15 lb. per sq. ft., which, if the closed section is of reasonably high efficiency, would give very high top speeds for quite heavy power loadings.

The structural difficulties of manufacturing a safe and reliable variable surface wing are extremely great, and the prospects of any great success in this direction do not seem to be very bright. It is true that one type of variable surface wing has been manufactured and has been used in flight.

### The Only Realised Example.

This is the Gastambide-Levavasseur wing, which was briefly described in this paper on December 29th, 1920.

This wing was provided with two sliding extensions, one on the leading and one on the trailing edge, which could be pushed out to increase the chord of the wing, and therefore the area, to nearly double the closed value, at the same time increasing both the camber and the angle of incidence. In the actual machine only the top wing is of variable surface, and the total change of surface for the whole machine is in the ratio of 3 to 5 only.

The weight of the fully loaded machine is said to have been 1,450 kg., and the surface, wings closed, to have been 32 sq. metres—a loading of 45 kg. per metre sq. or 10.8 lb. per sq. ft. With the wings open the landing speed was only 37.5 m.p.h., which is lower than could be reached with any known wing except the Handley-Page, on a load of nearly 11 lb. per sq. ft., but which is not particularly low for the loading of the opened wings, which is only about 6 lb. per sq. ft.

The weight per h.p. was 5.6 kg. or 12.3 lb., and the top speed of 124 m.p.h. is not particularly good for the high wing loading used. At the same time the speed range attained is high—over 3 to 1—but it is desirable to consider the cost of achieving it.

### The Cost of the Performance Achieved.

For this particular machine the weight of the wings with spars and wiring is given as 491 kg., equal to 34 per cent. of the weight of the loaded machine or to 9.4 kg. per sq. metre (practically 2.0 lb. per sq. ft.) of unfolded wing

As a result of this excessive wing weight only 110 kg. (240 lb.) of crew and useful load could be carried with a 260-h.p. engine, and about one hour's fuel.

### A Comparison with the Variable Camber Alternative.

Variable flap wings *á la* Fairey can be built for 1.0 to 1.25 lb. per sq. ft. Substituting these for the Gastambide-Levavasseur wing in this case one could carry 1,450 kg. at 37.5 m.p.h. with a loading of 7 lb. per sq. ft., or 35 kg. per sq. metre. The total wing surface needed would be 41 sq. metres, or 440 sq. ft., and the weight of wings would be reduced by 180 kg. (396 lb) at least. That is to say, one could now carry nearly 300 kg. (660 lb.) of load instead of 110 kg. for the same landing speed. There ought to be no difficulty in reaching the original top-speed on the weight per h.p. allowed, because one could use for high speed purposes a very much more efficient wing section than that needed to give room for stowage of the sliding extensions used in the variable surface type.

In a later edition of this type the wing weights have been appreciably reduced, but they are still well over 50 per cent. heavier than the equivalent flap wings would need to be. Such an added weight is obviously intolerable when consideration either of efficiency or of performance are of importance, and Mr. Fairey's latest figures for flap wings are believed to be considerably better than those assumed above.

### The Difficulties of the Variable Surface Problem.

It is difficult to see any large hopes of success with this type of wing. If one takes as a basis for such a wing a really efficient high speed wing, one will find that there is no room within it to stow away the moving extensions, and that it is difficult by any arrangement to cause the extended wing to assume a reasonably good shape.

No scheme yet proposed for variable surface arrangements offers better prospects of success than does the Gastambide-Levavasseur. Some are fairly free from the objection of mechanical complication and added weight, but they do not provide enough change of area to be of any practical use. If the section is unaltered doubling the area reduces the landing speed by only about 30 per cent., so that only large changes of surface can produce any appreciable effect.

### The Promise of the Handley Page Wing.

The most promising of variable wings seems to be the Handley Page. This has been described at some considerable length in these columns, and it will suffice here to describe its qualities very briefly.

It consists essentially of an ordinary aerofoil through which are cut one or more slots, passing from the under to the upper surface, these slots being parallel to the leading edge, and their lower openings are closer to the leading edge than are the upper openings.

To be effective it is necessary that each of the sections into which the aerofoil is cut by these slots should itself be of fairly good aerofoil shape, and that the section of the slot should taper gently from bottom to top, being narrower at the top than at the bottom.

The effect of fitting such slots to a wing is to increase the angle of incidence at which the maximum lift occurs, and to increase maximum lift. For instance, R.A.F.15, in the usual unaltered form, stalls at an angle of incidence of 14 degrees. Fitted with one slot the stalling angle rises to 21 degrees. At the same time the maximum lift is increased by about 60 per cent.

A greater number of slots may be fitted, and the effect is correspondingly increased. A high lift wing fitted with six slots stalled only at 45 degrees instead of the 15 degrees of the unaltered wing, and gave a maximum lift more than double that of the original section. It should be noted that in this case the camber was increased as the number of slots and the angle of incidence increased.

### Effect of Slots on Efficiency.

The effect of fitting these slots to a wing is to reduce the efficiency, i.e., to decrease the L/D ratio, at all angles below the stalling angle of the original wing. By completely closing the slot the original efficiency can be regained, and by merely closing the upper end of the slot in any manner which leaves a "fair" top surface to the wing a close approximation to the qualities of the unchanged wing can be secured.

The result is that an ordinary high speed wing section fitted with a single Handley Page slot at the leading edge becomes a wing with a maximum lift practically as high as that of any known high lift wing, and with that slot closed reverts to nearly the efficiency of the original section. Obviously such a change calls for some moving parts and some mechanism, and therefore the H.P. wing may properly be considered a variable wing.

In a sketch (Fig. 7) are shown two methods of securing opening and closing of such a slot when it is fitted to the leading edge of a wing.

In the upper case the front portion of the wing is moved bodily out from the fixed portion, leaving a gap. This can be effected in the manner shown in the figures of the Handley Page American patent (see THE AEROPLANE, p. 42, Jan. 12th, 1920), or by a number of conceivable alternative mechanisms. In the lower figure the front movable portion is pivoted at a point A near the nose of the section and is rotated so that its tail rises from the upper surface of the fixed part of the wing. The pivots may be carried on extended ribs from the main wing and the details of construction can be fairly simply arranged.

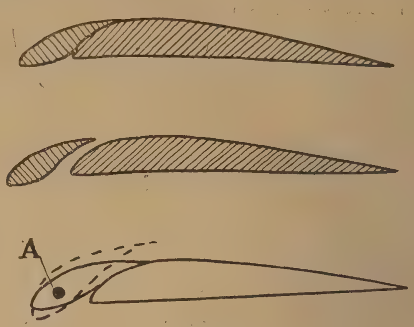

Fig. 7.

### Slots and Flaps Compared.

The increase in lift which can be obtained by opening such a slot in a normal high speed wing is probably somewhat greater than can be achieved by pulling down flaps. The extra weight of operating gear should not be widely different in the two cases. On the other hand, the slot cannot be completely closed on the underside unless the aerofoil section of either the moving or the fixed part of the wing is modified, and apparently such a change of shape destroys the efficiency of the opened slot. Hence with the slot closed the wing cannot be made as efficient as can a flapped wing.

Taking everything into account there is little to choose so far between the two systems in the results which can be obtained in practice. If a satisfactory method of entirely closing the slot can be devised, the Handley Page wing should be somewhat better than the variable camber type.

### The Wide Possibilities of Slotted Wings.

But there are two facts concerned with the H.P. wing which hold out possibilities of very great development.

Firstly one may fit a slot to any wing and increase the maximum lift, and therefore one may start with what is already a high lift wing and make it carry a still greater loading for a given landing speed, and, secondly, one may fit more than one slot and still more increase the maximum lift.

R.A.F.19—a distinctly high lift wing—will carry 10.5 lb. per sq. ft. at a minimum speed of about 50 m.p.h. Fitted with one slot the loading for the same minimum speed increases to 11.5 lb. per sq. ft. with two slots to 14 lb., with three slots to 16.6 lb., with five slots to over 20 lb., and with six slots to 25 lb. per sq. ft. In these cases, however, the camber has been increased as slots are opened, and the six-slot wing is of much heavier curvature than the original.

Unfortunately there are very grave difficulties to the use of these multi-slot very high lift wings, as the mechanical difficulties of closing up so large a number of slots are great, and with the slots open the efficiency of the wing is very poor indeed. Even if the slots are closed, the camber of these wings is too great for reasonable efficiency at high speeds.

Also the maximum lift in these wings occurs at angles of incidence of round about 45 degrees, and it is obviously impossible to drop the tail of any practicable aeroplane to the degree necessary to use or to land at such an angle, unless some arrangement is added to increase the angle.

For instance, one would need an undercarriage approximately as high as the whole machine is long to land at 45 degrees, and on the ground the airscrew axis would be tilted up some 35 degrees to 40 degrees at least. Therefore to use the whole possibilities of high loading combined with low landing speed one needs, first, a slot operating gear for say six slots; secondly, combined with this a camber changing device, and lastly an incidence adjustment. With six slots and a range of angle of incidence of round about 40 degrees the problem presents very serious difficulties.

(*To be continued.*)

## WING FLAPS AND OPERATING GEARS.

Following the publication of the first of the articles "On Variable and Other Wings," Mr. C. R. Fairey has communicated certain information as to the history of the Fairey variable flap gears and as to the claims made by the Fairey Aviation Company as to such wings, which are of considerable interest.

In the earliest stages of the war Mr. Fairey was convinced that if the seaplane was to be improved it was necessary to develop wings giving a high maximum lift. The Fairey "Campania" type of seaplane was fitted with such a wing, and later, in 1916, Mr. Fairey built and tested a series of six high lift wings.

None of these were really good. It was found possible to attain almost any maximum lift in reason, but it was not

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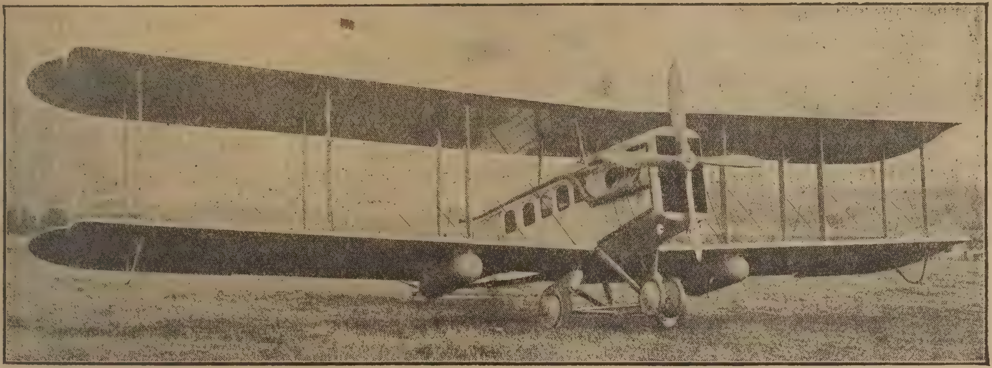

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found possible to combine this with a high value of L/D at the angles used for normal flight.

Upon a suggestion of Wing Commander Seddon's Mr. Fairey decided to fit trailing edge flaps to one such wing, which was then fitted to an experimental Hamble Baby.

Mr. Fairey was, of course, aware of the experiments carried out at Farnborough by the R.A.F. and of their failure, and had concluded that the failure was due to faults of design and construction, and to lack of attention to the operating mechanism and the stresses set up. He believes that as a result the Farnborough flaps sprung badly in the air and failed to produce the changes in section which were intended.

Accordingly he took great care to secure a rigid flap structure, and a ridiculously low gear was fitted to the operating mechanism, so that the pilot could only change camber very slowly, and would have ample time in which to notice and correct any change in trim or in stability which resulted.

After considerable experiment with this machine, and after having become satisfied that useful results were obtainable, the wing section used was slowly modified till finally a section equivalent to the normal low lift high speed type was reached when the flaps were in the normal position.

The Fairey Aviation Company do not, of course, claim the us of trailing edge flaps for increasing the lift of the wing. But they do claim a very wide range of operating mechanisms, including screw, rack and pinion gears, their main mechanical claim being a very wide one, covering the coupling of the control cables to two clips at two points, the distance between which can be varied by screw action. The gear shown in the first instalment of the article on variable wings (Fig. 3, p. 460), is exactly that used on the Fairey type III seaplanes and is covered by the aforesaid patent.

Further, the Fairey Aviation Company own a patent covering the division of these trailing edge flaps so that part may be used separately as ailerons, and a number of others covering mechanical variations of the mechanism. These patents hold good in England, the Colonies, and many foreign countries.

Mr. Fairey does not conceive that there can be any question of the utility of such flap camber changing devices. He points out that for some years Fairey seaplanes have successfully carried 12 lb. per sq. ft. without reaching unsafe landing speeds. The gear itself weighs very little, and the compact and robust construction possible with so high a loading is itself an adequate justification of the arrangement.

At the same time he believes that experiments with flaps are likely to prove disappointing if adequate attention is not given to the stresses set up and if the trailing edge is allowed to become wavy in flight.

Mr. Fairey's claims are justified by the results attained. but does not believe that it has yet shown any result comparable with those attained by flaps. He claims that flaps have not yet been tried on some of the most modern wing sections, and that his own most recent improvements in flapped wings have not yet appeared. He hopes that it will be possible to produce considerably better results in the near future.

Mr. Fairey's statements call for little comment in general. The author of the article on "Variable Wings" was at the time at which Mr. Fairey began his tests on flaps working upon the same problem of attaining high maximum lift. He was also to a very large extent inspired by Wing Commander Seddon. The use of flapped wings was considered and a machine was designed for the use of such wings together with a complete control gear. He (the author) now regrets that he failed to follow Commander Seddon's advice in one particular—that of taking out a patent for the operating gear. Perhaps, however, it would have disturbed the amicable relations which up to the present have subsisted between Mr. Fairey and himself.

Mr. Fairey's scepticism as to the value of the slotted wing is presumably based upon the difficulty of arranging a satisfactory slot which can be closed so completely that it does not spoil the high speed qualities of the wing. For it seems to be fairly satisfactorily established that, however high a maximum lift one may develop with an unslotted wing, one can increase it by adding a slot to that same wing. The slotted wing undoubtedly introduces certain difficulties of operation and it seems impossible at the present time to make full use of its properties on any practical aeroplane. These difficulties are briefly dealt with in the third of the articles on Variable Wings above.

It may be well to remark here that in the articles which have so far appeared various types of wings have been discussed only in regard to their more direct effects on performance. The very great indirect results on the design of a complete aeroplane which may result from the use of heavy loadings have not yet been considered.

## FOR WOULD-BE SLIDE RULE EXPERTS.

Presumably in these enlightened days all engineering students, and even some others, are taught the elementary use of the slide rule. But it is surprising to discover how many of those who constantly use this instrument fail to make full use of its possibilities.

A little booklet just published, entitled "Useful Engineer's Constants for the Slide Rule," by Mr. J. A. Burns, should be acquired and studied by all those who do not feel certain that they are making the best use of their slide rules. The art of using a slide rule quickly and accurately is largely one of securing economy in the number of settings, and a very large economy is possible wherever one has to deal with a large number of problems of a similar nature, if one works out suitable constants for those problems once and for all.

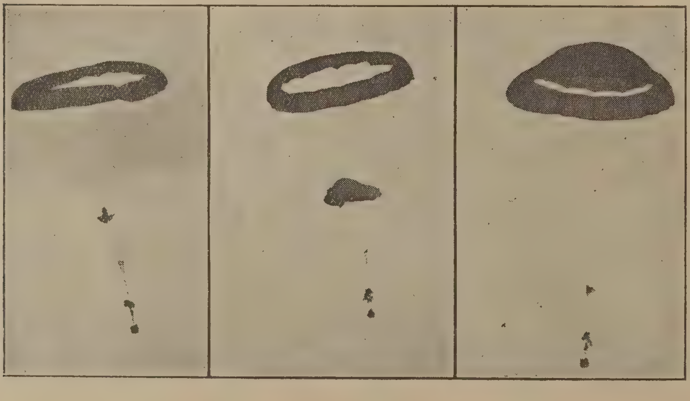
For instance if one knows the speed of an aeroplane in miles per hour, and the thrust required at that speed in lbs., the thrust h.p. needed at that speed is arrived at by reducing m.p.h. to feet per minute, which means multiplying the m.p.h. by $\frac{5{,}280}{60}$, then multiplying by the thrust, and finally dividing by 33,000, the number of ft. lb. per minute equivalent to 1 h.p.

This will require five settings of the slide rule, and at each setting an error is likely to creep in. But if the constant $\frac{5{,}280}{60} \times \frac{1}{33{,}000}$ is worked out it is found to become $\frac{8}{3{,}000}$ or 0.0026. Setting 3 on one scale under 8 on the other gives this value in one setting with the minimum chance of error, and saves two settings in attaining the desired result. This constant can easily be remembered and saves much time in arriving at the result. The book in question gives no examples directly available for aeronautical purposes, but it suffices to show the general principles which should be pursued in using the slide rule.

("Useful Engineers' Constants for the Slide Rule, and How they are Obtained." By J. A. Burns. Third Edition. London: Percival Marshall and Co. 2s. net.)

## THE AIR CONFERENCE, 1920.

The papers read before the Air Conference held on Oct. 12th, 13th and 14th, 1920, and the debates consequent thereon, were published at the end of February as a Blue Book (Cmd. 1157). Such of the public as are interested in past talk can buy this compilation for 2s. 6d.



**A COMPOUND PARACHUTE.—The three photographs show three stages in the opening of a new type of aircraft parachute, built by the Ballonhüller Gesellschaft of Tempelhof, Berlin. The supporting surface is in two parts, one an outer ring, and the other a central dome of normal shape. The ring opens first, as shown in the left-hand picture, the central portion remaining stowed till the speed of descent has been checked. It can be seen in the left-hand picture, just above the junction of the suspension chords, and about to unfurl. In the central picture it is partly opened, and the third picture shows the completely opened apparatus. It is claimed that the shock of opening is greatly reduced, and that the operation is certain.**

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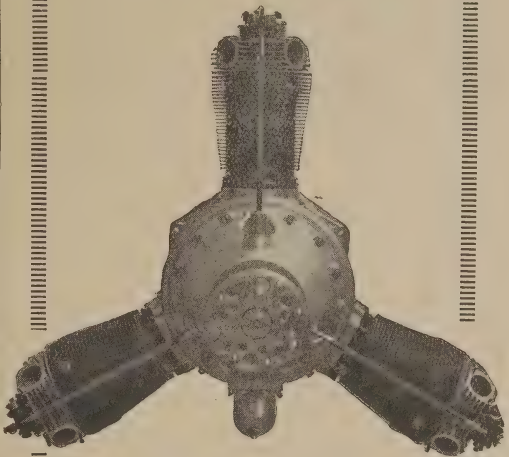

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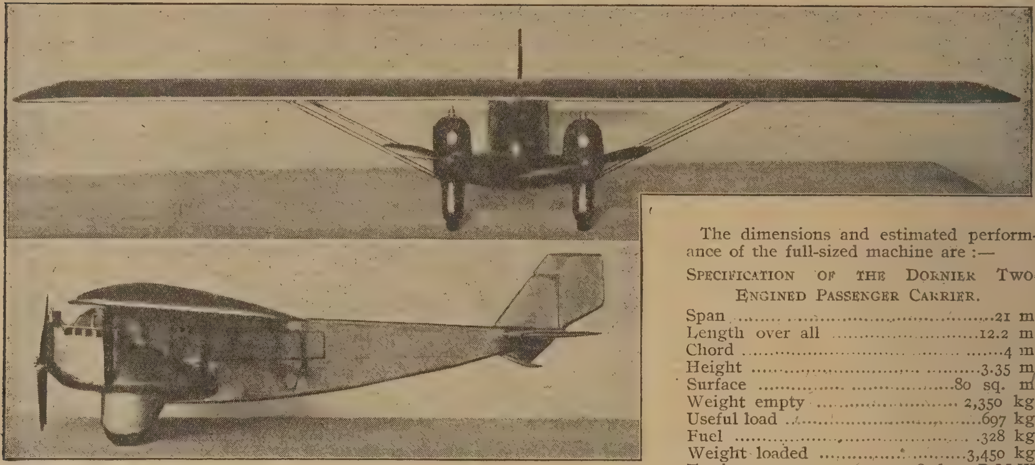
# A NOVEL TWIN-ENGINED MACHINE.



The Model of the Two-engined Dornier Monoplane

The two photographs here reproduced are of a model of a new Zeppelin machine now nearing completion at the Lindau works to the designs of Ing. Dornier, and show characteristic signs of the ingenuity always to be associated with the name of this designer.

In so far as the fuselage and wings are concerned, the lines of the recently described single-engined monoplane of the same origin are followed, and it may safely be assumed that steel is used for the main load-carrying members, with duralumin as covering and for the less heavily stressed members. The undercarriage is like that of the previous model, attached to an overhanging structure built out from the fuselage, but these projections are considerably enlarged and encase the landing wheels in mudguard-like shields.

Upon these mudguards are carried forwardly projecting engine bearers, engines, tanks and cowling. The engines are as close together as airscrew clearances will permit, the airscrew blades overlapping the nose of the central fuselage.

The pilot's seat is in the nose of the fuselage, and below the wings is the usual passenger cabin, seated for eight passengers, together with a lavatory. Space for luggage intervenes between the pilot and the cabin proper.

The dimensions and estimated performance of the full-sized machine are :—

SPECIFICATION OF THE DORNIER TWO-ENGINED PASSENGER CARRIER.

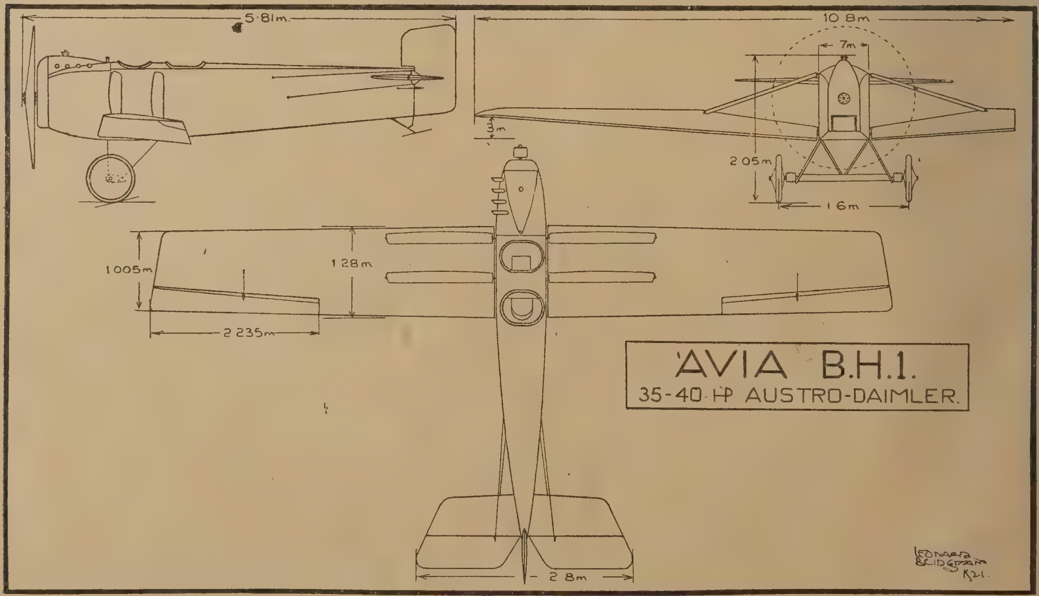
| | |
|---|---|
| Span | 21 m. |
| Length over all | 12.2 m. |
| Chord | 4 m. |
| Height | 3.35 m. |
| Surface | 80 sq. m. |
| Weight empty | 2,350 kg. |
| Useful load | 697 kg. |
| Fuel | 328 kg. |
| Weight loaded | 3,450 kg. |
| Engines | 2 185-h.p. B.M.W. |
| Loading | 43.5 kg. per sq. m. |
| Power loading | 9.35 kg. per h.p. |
| Maximum speed | 180 km.p.h. |
| Cruising speed | 150 km.p.h. |
| Ceiling | 6,000 m. |
| Range (cruising) | 750 km. |

## A CZECHO-SLOVAK SPORTING MACHINE.

At the Prague Aero Show for 1920 a small monoplane, somewhat reminiscent of the Junkers monoplane, attracted a certain amount of attention. This was the Avia B.H. monoplane, built by the Avia Co. of Prague, and designed by M.M. Benes and Hajn.

Drawings and a description of the machine recently appeared in our Czecho-Slovak contemporary "Leteckvi," but owing to the reading matter being in the language of that country, very little information that is at all intelligible can be extracted therefrom. Nevertheless, the following bare particulars can be assumed as being more or less correct, as, fortunately, line drawings and figures are translateable, and quite an amount of information can be gleaned from them.

The Avia B.H. is a small two-seater monoplane fitted with a 35-40-h.p. Austro-Daimler engine. The fuselage is very deep throughout its length, the top and bottom longerons being nearly parallel. At the rear a balanced rudder is hinged to the vertical knife-edge. The planes of semi-cantilever type



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are mounted on the bottom longerons of the fuselage and are braced, from a point about ⅓ of the span, to the top longerons by four streamline struts. The planes, which are set at a slight dihedral angle, taper from root to wing-tip and also have a decided lump at the point of attachment for the bracing struts. The machine is entirely of wooden construction, the fuselage and ailerons being covered with three-ply and the wings and tail unit are fabric covered.

The undercarriage consists of two vees, the intervening space between the joint and rear legs being streamlined in, carrying a divided axle on rubber suspension, further bracing being supplied by two tubes running from the top front end of each Vee to the centre of the divided axle, the whole reminding one very much of the Morane-Saulnier undercarriage.

### SPECIFICATION.

| | | | |
|---|---|---|---|
| Span | 35 ft. 5 in. | Height | 6 ft. 8 in. |
| Length | 19 ft. | Weight (empty) | 582 lb. |
| Area | 116.2 sq. ft. | Weight per h.p. | 253 lb. |
| Weight (loaded) | 1,012 lb. | Engine | 35-40-h.p. Austro-Daimler |
| Weight per sq. ft. | 8.7 lb. | | |
| Chord (max.) | 4 ft. 2¼ in. | | |

## THE LUIGI MAPELLI CHALLENGE CUP.

The rules and regulations for the contest for the Luigi-Mapelli Cup for small aeroplanes have now been published. In view of the high esteem in which Britain is held in Italy, the promoters hope that there may be British competitors for the event, and point out that their presence would serve to still further enhance that esteem and extend the knowledge of British products in Italy. The following *précis* gives the main features of these rules and regulations.

### GENERAL REGULATIONS.

The contest is to be held annually and shall be international. The winner of each annual contest will become the holder for the ensuing year of an *objet d'art* of the value of 50,000 lira, presented by Cav. Luigi Mapelli. The competition is open to all aeroplanes driven by an engine whose cylinder capacity does not exceed 455 c.c. (Note.—The standard 3½-h.p. motor-cycle engine capacity is 500 c.c.)

The competition is to be held under the rules of the F.A.I. and the Aero Club of Italy.

The competition is to be a speed contest, and the length of the course is to be increased annually, and is not to be less than 160 km. or more than 600 km. Stoppages *en route* are allowed, but supplies of fuel may only be taken in at authosised controls. Repairs may only be carried out with the aid of outfits carried on the machine. Only for starting and taking in supplies of fuel will assistants to the crew be permitted, and then the number of assistants is limited to two.

During the competition each pilot must reach a height of not less than 2,500 metres.

The course is to be within the country of the holder of the Cup, but the organisation ofthe competition is to be in the hands of the *Gazzetta dell' Aviazione*, with the aid of the local authority approved by the F.A.I.

The competition is to be held in the autumn, and the rules for each contest must be published by May 15th.

Entries are open to manufacturers of all nations, not more than three machines being allowed to be entered by one manufacturer.

Entrance fee is 500 lira for each machine, and this fee must be paid to the *Gazzetta dell' Aviazione* not less than 8 days before the date of the competition. Half the fee is to be repaid for any machine which shall complete one lap or stage of the course. The Cup is to be held by the firm entering the winning machine. The Cup becomes the property of the firm which wins it three times—not necessarily consecutively. If a firm hold the Cup on two occasions, and no competition is held during the two years following that firm's last victory, the Cup becomes the property of that firm.

Cav. Luigi Mapelli undertakes to assign to the F.A.I. before the two first annual competitions, the sum of 5,000 lira, to be paid as cash prizes, 3,000 lira to the pilot of the winning machine, and 2,000 lira to the pilot of the first Italian machine. Both will be won by an Italian pilot if his machine wins the Cup.

Subsidiary prizes may be added, provided they do not change or modify the conditions of the contest.

### REGULATIONS FOR THE 1921 CONTEST.

The contest is to be held during the Brescia Aviation meeting on Sunday, Sept. 4th. The course is the circuit bounded by the flying fields of Montechiari, Ponte San Pietro, Arcore, Erba, Malpensa, Taliedo, Montechiari. The total distance is 290 km. Each aerodrome mentioned is a control, the length of the stages intervening varying between 87 km. and 21.5 km.

Montechiari is the starting point, and machines are to start one at a time at five minute intervals, starting at 9 a.m. Machines are to be placed on the starting line, engines stationary, and are to start up engines on the signal to start, time being reckoned from the signal. Any machine which fails to get off within three minutes from that signal must be withdrawn, but may make a further attempt later.

Each landing field has a triangular space marked on it. The boundary of this space must be crossed, by taxying after landing, and the time of crossing will be taken as the time of arrival. Two persons may assist in filling fuel and oil at each landing, but these two must be designated beforehand to the officials.

The time will be reckoned as that elapsing from the signal to start at Montechiari to that of stopping the airscrew on the landing mark at the same aerodrome, less the times neutralised in the recognised controls. The maximum time allowed for the circuit will be eight hours.

In addition to the prizes given by Signor Mapelli, a gold medal value 500 lira is given by the "Societa Anonima Imprese Aeiro Milano" to the manufacturer of the second machine, and one value 300 lira to the manufacturers of the third.

The *Gazzetta dell' Aviazione* present a medal value 500 lira to the pilot of the second machine. No one pilot may claim more than one prize in virtue of the performance of two machines of the same type.

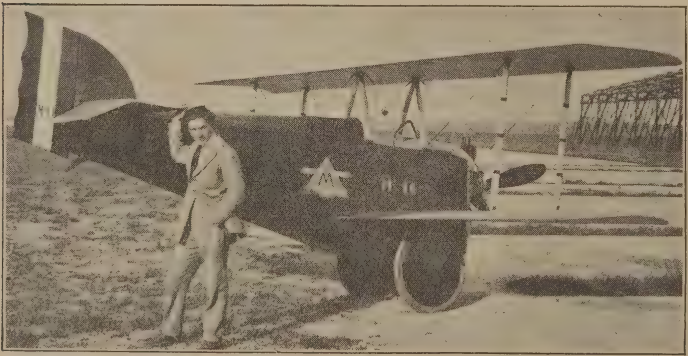
Entries are received at the *Gazzetta dell' Aviazione*, Via Torino 10 and 12, Milan, or Casella Postale 1001, Milan. Entries must be accompanied by the sum of 500 lira for each machine, and must reach Milan by August 27th, 1921.

## REFLECTIONS ON THE GORDON BENNETT RACE.

Technical Note No. 50, issued by the American Advisory Committee for Aeronautics, consists of a critical essay by M. W. Margoulis, the Aerodynamic expert at the Paris Office of the Committee on the machines entered for the last race for the Gordon Bennett Cup. M. Margoulis was long associated with M. Eiffel at the latter's aerodynamic laboratory, and his opinions on the subject are distinctly interesting.

He criticises the American Curtiss and Verville racers somewhat severely. As to the Dayton-Wright with variable camber wings, he considers that the wing section used was unsuitable for very high speeds, and that better results would be attained by somewhat larger fixed wings, saving the weight and resistance of the variable camber gear which was fitted. He also points out that despite its 700-h.p. engines, the Verville was of the same weight per h.p. as the Nieuport, and that there was nothing in the design which would lead one to expect it to be faster than the French machines.

He also comments on the fact that with the Nieuport cutting down the wing surface reduced the speed contrary to



**THE MACCHI M.16.—One of the most successful of the small Italian sporting machines. Fitted with a three-cylinder 35-h.p. Anzani engine, it is outside the permitted engine capacity for the Mapelli Cup referred to above. The machine is of 6 metres span, weight fully loaded 255 kg. (561 lb.), and makes 120 km.p.h. The landing wheels may be detached and a pair of floats substituted in a few minutes.**

all reasonable expectations. Kirch's machine with 13 sq. m. was actually faster than Sadi Lecointe's with 12 sq. m. and a similar machine cut down to 11 sq. m. was considerably slower than the other two.

This is entirely contrary to all that would be expected from the results of tests on wing models. But the speeds attained by modern racing machines under the conditions of flight are far removed from all possible wind tunnel test conditions, and it seems possible that the habits of aerofoils are appreciably modified at the speeds now attained.

M. Margoulis finally discusses future regulations for high speed races, and concludes that proposals for the limitation of engine power, or restrictions as to landing speed or loading are useless, and that the best results will be attained by leaving perfect freedom to the designers of racing craft in these matters.

## NOTES FROM ABROAD.

### FRANCE.

### The New 3-Engined "Goliath."

The 3-engined "Goliath" has just completed the tests for the Concours Militaire for new aircraft and has emerged very satisfactorily.

The following are the figures required of it, and obtained by it in the performance tests :—

Ceiling, required 4,500 m., obtained 4,500 m.; speed at 2,000 m., required 150 km.p.h., obtained 159 km.p.h.; speed at 3,000 m., required 110 km.p.h., obtained 109 km.p.h.; useful load, required 2,000 kg., obtained 2,200 kg.

The required duration flight calls for a flight of 4,500 km. in stages of 500 km. without landing. The three flights—Toussus-Orleans-St. Inglevert, St. Inglevert-Rouen-Metz, and Metz-Dijon-Toussus—were covered three times, the total flying time for 4,500 km. being 34 hours. The three last stages were flown in rain, hail and snow, at an altitude of less than 200 m. The pilot in all these tests was M. Gonin, who previously had been responsible for a Paris-Marseilles-Paris flight in 9 hr. 30 min., and a Paris-Constantinople flight, both these latter being in an ordinary two-engined Farman "Goliath."

### GERMANY.

### Hun Humour.

Those who are still foolish enough to believe that the German has no sense of humour should be introduced to a paragraph from the *Automobil-Flugwelt* of May 15th, 1921. This excellent technical paper quotes a story from the *Munchener Neuesten Nachrichten* in which it credits the Munchener paper with deliberately making an April Fool of its readers. The joke played on the readers was in fact merely a transcription of that story which appeared in the *Daily Mail* about the wonderful new aeroplane fitted with a ram which when attacking an opponent withdraws its wings and airscrew and charges straight through the hostile aircraft. The English paper published the yarn in all seriousness, whereas the more intelligent German publishes it as a joke.

### SPAIN.

### Tenders Invited.

According to the *Gaceta de Madrid* of May 12th, tenders are invited up to June 4th next for the construction of a balloon shed and workshop for the "Parque Aerostatico de Guadalajara." The maximum quotation admissible is 191,250 pesetas. A deposit is required of 9,562.50 pesetas.

The conditions of tender can be seen at the "Comandancia de Ingenieros, Calle de Serano 49, 1st Floor, Madrid."

United Kingdom firms interested in this and other contracts in Spain who are unrepresented in that country should apply to the Department of Overseas Trade, 35, Old Queen Street, Westminster, S.W.1, for assistance in appointing a representative.

### JAPAN.

### British Catalogues Wanted.

British manufacturers of aeroplanes, aero-engines, material and accessories are requested to send copies of their catalogues, together with photographs if possible, of the said products, to: Mr. N. Katoh, Seiko Shokai, Eirakucho, Marunouchi, Tokio, Japan.

Mr. Katoh is one of the chief writers for "Hikokwai," which, being translated, means "The Aeronautic World." He wishes to be able to describe and illustrate in that paper as many British products as possible. Recent issues of the journal, which is obviously of the highest class, include such interesting matter as the latest types of parachutes as carried on the backs of aviators, modern torpedo-dropping deck-flying machines of the type of the Sopwith "Cuckoo" and excellent views of the Nieuport "London" triplane, which this paper was prevented from publishing out of respect for the wishes of the Intelligence Department of the Air Ministry.

It will be just as well if British manufacturers do supply material for illustrations in this excellent Japanese paper, as they will thus certainly bring their products particularly to the notice of the Intelligence Departments of the United States Army and Navy.

### HONDURAS.

### Another Score for Bristols.

News to hand from Tegucigalpa states that the first aerial flight in the Republic of Honduras has been effected by a British pilot on a British aeroplane.

The machine was a "Bristol" Fighter, type F.2B., and the route traversed was between San Pedro Sula and Tegucigalpa, a distance of some 200 miles. The time occupied in the flight was 1 hr. 37½ min., an average speed of 110 m.p.h., and it is interesting to record that in the course of the flight an altitude of 18,000 ft. was attained.

## TRADE NOTES.

### R.A.F. Insurance.

With reference to recent discussions on the insurance of aviators and more especially of the insurance of pilots and observers and other flying personnel of the Royal Air Force, it is of interest to note that Bray, Gibb and Co. Ltd., of 166, Piccadilly, are in a position to quote for these special policies and are in fact dealing with several inquiries from R.A.F. personnel at the present moment.

Mr. E. R. Adams, the manager of the Piccadilly office of Bray, Gibb and Co Ltd., could probably claim to be the first insurance man in this country to deal seriously with the problems of aircraft insurance and, speaking from many years of personal knowledge of Mr. Adams, one can vouch for the fact that so far as he is concerned anybody who does business with him is always sure of a square deal.

### Ground Engineers Wanted.

There is a situation open in the North of England for a rigger with a joy-ride concern, and another, also in the North, for a competent mechanic who is both engine hand and rigger. Both must hold Air Ministry certificates as ground engineers. Enquiries should be sent to this office marked X or X + Y respectively.

### Back Number Wanted.

Would any reader of THE AEROPLANE who is able to supply a copy of the issue dated Feb. 28th, 1917 (Vol. XII, No. 9) be so kind as to send it to THE AEROPLANE Office, 175, Piccadilly? The Aero Club de France wants to complete its collection.

### COMPANY NOTICES.

### Appointment of Receiver.

FARRINGDON PROPELLER AND ENGINEERING CO., LTD.—L. W. Millar, of 10, Coleman Street, E.C., as receiver and manager on May 10th, 1921, under powers contained in debentures dated January 23rd and June 28th, 1920.

## TO THE ROYAL AERO CLUB.

The following letter has been received :—

Felsted School, Essex, May 14th, 1921.

Sir,—I am a regular reader of THE AEROPLANE and saw with interest your articles on Croydon as it should be. I have been staying at Coulsdon lately and went up to the aerodrome very frequently to see the stunting, etc. The authorities very kindly allowed me to look over the sheds and were very pleased to answer multitudinous questions, and, in fact, did all they could to make it interesting for me.

What I should like to know is, why is not the Aerial Derby held in the Summer holidays instead of the term time? Surely there are thousands of boys, and girls, at school like myself who want to see it and cannot because it is term time. After all, what is the use of our elders taking an interest in it all if we are unable to see it and form our opinions, however futile; for will it not be our business to carry it on in a few years hence?

I, for one, am keenly interested in flying of all sorts, especially because I am lucky in that I live about a mile from Lympne Aerodrome and know everyone up there pretty well, and also because Mr. Pierson, the Vickers designer, is an Old Felstedian. To him, I suppose, Felsted is not much, but to us he is certainly something.

(Signed) S. PATRICK OSBORNE.

[Mr. Osborne's letter is to be commended to the attention of the Committee of the Royal Aero Club, and to the organisers of the R.A.F. Tournament as well. As Mr. Osborne says, it is the younger generation who will have to carry on the good work a few years hence, and it is very advisable that they should be given every opportunity of interesting themselves in aviation to-day. There should be very little difficulty next year in holding both the Air Force Pageant and the Aerial Derby at Croydon at the very beginning of the Summer holiday period.—ED.]

## THE LEVEE.

His Majesty the King held a Levée on May 30th at St. James' Palace.

His Royal Highness the Duke of York, K.G , was present attended by Wing Commander Louis Greig.

In attendance upon His Majesty was Air-Marshal Sir Hugh, Trenchard, Principal Air Aide-de-Camp.

The Secretary of State for Air attended the Levée.

The following officers of the Royal Air Force had the honour of being presented to His Majesty by the Secretary of State for Air :—BENTHAM, Flying Officer John; COMPSTON, Flight Lieut. Robert, D.S.C., D.F.C.; DICKEY, Flight Lieut. Robert, D.F.C.,; DIXON, Flying Officer Noel, A.F.C.; FELLOWES, Flight Lieut. Henry; GODFREY, Flying Officer Cyril; GRANT, Squadron-Leader Andrew, M.B.E.; HALL, Flight Lieut. Geoffrey, A.F.C.; HARNETT, Squadron-Leader Edward St. Clair, O.B.E.; HOOPER, Flight Lieut. Geoffrey, M.C., D.F.C.; LONGTON, Flight-Lieut. Walter, D.F.C., A.F.C.; MACKAY, Flight Lieut. Charles, M.C., D.F.C.; ADDENBROOKE-PROUT, Flight Lieut. Reginald, O.B.E., M.C.; STAMMERS, Flight Lieut. Frederic, O.B.E.; TEDDER, Squadron Leader Arthur W.; WARD, Flying Officer Neville.

## THE AIRSHIP CRISIS.

On May 30th Major-General Sir Frederick Sykes, Controller-General of Civil Aviation, received at the Air Ministry a number of journalists, to whom he set forth the Air Ministry's policy concerning the remnants of our airship fleet. Briefly it amounted to a statement that unless some commercial concern comes forward and takes over the airships by Aug. 1st, the whole lot will be handed over to the Disposal Board Ministry of Munitions as scrap. Meantime the Department of Civil Aviation proposes to run one of the best of the airships between London and Paris and London and Brussels in order to educate the public in the manœuvring of airships. Thus financiers who are thinking of backing an airship line will have opportunities of themselves experimenting with the comforts or discomforts of airship travel.

Sir Frederick explained that owing to absolute lack of money it is no longer possible for the Air Ministry to maintain the airships. He said that the French promised to put up a temporary mooring mast near Paris and possibly another near Toulon. Replying to an enquirer he said that the Eiffel Tower was not considered suitable as a mooring mast.

Croydon would be the starting place, as passengers would not want to travel to Pulham, in Norfolk, in order to start. There was no intention to compete with aeroplanes. He hoped that it would be possible to give airship demonstrations to the Dominions' Premiers who are coming to England.

Replying to Major C. C. Turner, Sir Frederick said that two airships were at present manned and that there would be no difficulty in manning all ships which were fit for duty.

Replying to a Scottish journalist, Sir Frederick said that the Airship Station at East Fortune, near Edinburgh, would have to be abandoned. One ventures to suggest that even so there is nothing to prevent a Scottish commercial concern from taking over one or more airships and establishing an airship line between Aberdeen and Jerusalem for mutual trade. This would at any rate afford one method of getting rid of the only two Jews who are alleged still to exist in Aberdeen.

General Sykes pointed out that the advantage of an airship line to the East is that an airship can avoid landing in foreign countries and can touch at British possessions only. All figures concerned with airships would be placed at the disposal of *bona fide* possible buyers. The present offer must close on Aug. 1st as it had already been open too long. If the offer was not accepted the personnel of the airships would go back to heavier-than-air work in the R.A.F.

## THE TOURNAMENT AT OLYMPIA.

Everybody who has not already done so ought to make a point of going to the Naval, Military and Air Force Tournament at Olympia this week. Those who are interested in the Air Force should go for several reasons. First of all they should go in order to see the actual progress which is being made in training the new generation of R.A.F. mechanics. The boys from Cranwell with their volunteer band make a perfectly wonderful show, and their deportment indicates that they have the makings of good soldiers as well as mechanics. So few people realise that in future Air Force units on the outskirts of the Empire will have to fight as well as tinker with machinery.

The rest of the Tournament indicates the standard which the R.A.F. still have to reach. When the whole of the Air Force can do its arm drill with the precision of the King's Squad R.M.L.I., and can handle its material with the speed and dash with which the bluejackets manhandle their guns, and can manœuvre their aeroplanes in the air with the precision with which the Royal Horse Artillery does its driving, then the R.A.F. will have attained something very like its limit in warlike efficiency.

## THE AERIAL DERBY.

One has the authority of Mr. H. P. Folland, chief of the designing staff of the Nieuport and General Aircraft Company Ltd. (of which the moving spirit is Sir Samuel Waring, Bart., who obtained a title in connection with aviation) for stating that the reports in various sections of the Press to the effect that that company is building or designing, or is having built or designed for it a high speed monoplane or biplane with a 450-h.p. Napier "Lion" or any other engine, is absolutely untrue, nor is there any grain of truth in the suggestion whatever. This report has not been published in THE AEROPLANE.

It is just possible however that the directors of the Nieuport Company may decide to enter the "Goshawk" for the race. This machine still holds the British speed record which it obtained even though the engine was not running all out at the time.

It may be remembered that in last year's Derby it had to land at Brooklands in the first round through sheer bad luck, and if entered this immensely fast machine should stand an excellent chance of winning, especially if, as is probable, it is slightly altered and cut down.

The Handasyde Aircraft Company are entering a cantilever monoplane. This, one believes, is an evolution of the "Semiquaver," now the property of that company. In its new form it will probably be called the "Semi-breve" or the Demi-semiquaver." Mr. Raynham will probably be the pilot

A. V. Roe and Co. are entering three or four machines. The first string one gathers is a very fast machine with a Napier "Lion" engine. At least so rumour says, though one does not vouch for the accuracy of that statement, but many facts point to its being true. There will almost certainly be a "Baby" Avro or two in for the handicap. Mr. Bert Hinkler hopes to be back from the Antipodes in time for the race.

As already announced, the Bristol Aeroplane Company is entering a machine with a 400 h.p. Bristol "Jupiter" engine to be flown by Mr. Uwins. A second entry from that firm is possible.

The dark horse of the race is a small biplane to be fitted with a 450 h.p. Napier engine, which will be known as the "Bamel." It has been designed by one of the best-known designers of speed machines in the country and is being constructed by a firm whose name is not well known

M. Sadi Lecointe, the winner of the Gordon Bennett Cup, has definitely entered on a Nieuport with a 300-h.p. Hispano-Suiza engine.

It is also rumoured fairly reliably that the French are entering a Spad and a Hanriot monoplane.

One believes that there is no truth in the report that Sir Samuel Waring, Bart. (who obtained, etc.), is entering the Bat "Crow" fitted with a Napier "Cub" to be flown by Mr. H*rr* H*rp*r.—G. D.

## AIRCRAFT AND DERBY TRAFFIC.

By way of lessening congestion on the roads leading to Epsom to-day (Wednesday) De Havilland aeroplanes from Stag Lane will observe from the air how traffic is progressing on the ground. Wireless messages will be sent to controls on the ground, and if one road is found to be too congested, traffic will be diverted to another road which is seen from the air to be less crowded.

The airship G-FAAG (R.33) will also be used for this purpose.

This seems to be an eminently sensible idea, and will doubtless go a long way towards simplifying traffic control on special days such as Derby Day.—G. D

## L'INDICATEUR AERIEN.

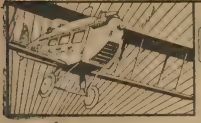
Under the above title an excellent little booklet has been prepared by our esteemed French contemporary *L'Air* that gives in a dozen pages all the information dealing with the French commercial air transport companies.

The following details are given dealing with the Bordeaux Montpelier, the Nimes-Nice, the Paris-London, the Paris-Brussels-Amsterdam, the Bayonne-Bilbao-Santander, the Paris-Strasbourg-Prague-Warsaw, and the Toulouse-Spain-Casablanca services; offices of the company, times of departure, machines used, prices for passengers and goods, insurance arrangements, postal arrangements, times of collection, etc., in fact everything that concerns aerial transportation.

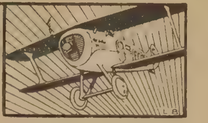
In order to ensure that everything is up to date, *L'Indicateur Aerien* will be published on the first of every month.

Priced at 50 centimes, the booklet should certainly be in the hands of everyone concerned with, or likely to use, aerial transport, particularly since the exigencies of the British subsidy scheme often compel British travellers to avail themselves of the French services owing to lack of British machines.

Copies of the first number will be sent gratis to all regular subscribers to *L'Air* on application.—L. B.



# COMMERCIAL AERONAUTICS
## AND CIVIL AERIAL TRANSPORT.



## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### OFFICIAL NOTICES.

NOTICES TO AIRMEN.

No. 38, April 25th, 1921.—Croydon Aerodrome: Telephone Number Notes correction.

No. 39, May 1st, 1921.—Aerodromes for civil use: Amendments.

No. 40, May 6th, 1921.—Communication between Civil Aircraft and R.A.F. Ground W/T stations. Explains this.

No. 41.—May 11th, 1921.—Switzerland: Air Navigation on and above Swiss waters. Geneva Customs Aerodrome.

No. 42, May 11th, 1921.—France: Flying of Captive balloons on the St. Inglevert-Paris route discontinued.

No. 43, May 17th, 1921.—Aerodromes for Civil Use: Amendments.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS:—B.A.—Berkshire Aviation Company. B.C.—Bristol Aeroplane Company. C.A.—Dept. of Civil Aviation. F.R.—Franco-Roumanie G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line K.L. Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes. M W.—Marconi Wireless Telegraph Co. Ltd. N.L.—Nordiska Luftrederi Akticbolaget. P.L.—Petters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aeriens (S.N.E.T.A.). B.M.—Brompton Motor Co.

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

#### MAY 23rd:

K.L., Fokker, H-NABJ, London-A'dam, 10.15-1424, G.M., Nil, Hofstra.
M.A., Breguet, F-CMAB, London-Paris, 10.46-13.30, G., 3, Donelin.
S.N., DH9, O-BIEN, London-Brussels, 11.58-15.01, M., Nil, Sahnovsky.
I.L., Vimy, G-EASI, London-Paris, 12.23-15.40, G.M., 11, Powell.
I.L., Bat, G-EAPK, London-Paris, 18.39-21.03, Nil, 1, Barnard.
M.A., Breguet, F-CMAD, Paris-London, 10.21-17.50, G.M., Nil, Perignon.
S.N., DH4, O-BARI, Brussels-London, 11.55-14.00, G.M., 11, Delzenne.
G.E., Goliath, F-GEAB, Paris-London, 12.50-15.30, G., 12, Favreau & 1.
M.A., Breguet, F-CMAC, Paris-London, 12.57-15.10, Nil, 3, Paille.
K.L., Fokker, H-NABI, A'dam-London, 14.06-17.02, G.M., 3, Duke.
M.A., Spad, F-CMAY, Paris-London, 15.28-17.46, G., Nil, Delily.
M.A., Spad, F-ACMA, Paris-London, 16.25-18.42, M., 3, Malfanti.

#### MAY 24th:

K.L., Fokker, H-NABN, London-A'dam, 10.10-14.32, G.M., 1, Olley.
M.A., Breguet, F-CMAC, London-Paris, 10.12-12.50, G., 2, Paille.
S.N., DH4, O-BARI, London-Brussels, 12.05-14.27, G.M., Nil, Delzenne.
M.A., Salmson, F-CMAN, London-Paris, 13.00-15.50, G., Nil, Delage.
G.E., Goliath, F-GEAB, London-Paris, 12.58—, G., 12, Favreau & 1.
M.A., Breguet, F-CMAD, London-Paris, 16.14, 19.12, Nil, 2, Perignon.
M.A., Spad, F-CMAY, London-Paris, 16.08-18.30, Nil, Nil, Delily.
M.A., Spad, F-ACMD, Paris-London, 10.03, 12.20, G.M., 5, Le Men.
I.L., Vimy, G-EASI, Paris-London, 11.10-13.52, Nil, 10, Chattaway.
S.N., DH4, O-BELG, Brussels-London, 11.53-14.12, G.M., 2, Catta.
M.A., Spad, F-CMAV, Paris-London, 12.40-15.01, G.M., Nil, Le Sec.
K.L., Fokker, H-NABH, A'dam-London, 14.00-19.20, G.M., 3, Hofstra.
K.L., DH9, H-NABO, A'dam-London, 14.17-16.30, Nil, 2, Holmes.
I.L., DH18, G-EARO, Paris-London, 15.45-18.17, G., Nil, Barnard.
M.A., Breguet, F-CMAM, Paris-London, 16.15-18.48, M., 3, Briere.

#### MAY 25th:

K.L., Fokker, H-NABI, London-A'dam, 10.00-13.00, G.M., 3, Duke.
M.A., Spad, F-ACMA, London-Paris, 10.04-12.35, G., 3, Malfanti.
K.L., DH9, H-NABO, London-A'dam, 12.35-15.44, Nil, Nil, Hofstra.
I.L., Vimy, G-EASI, London-Paris, 12.45-15.40, G.M., 9, Chattaway.
S.N., DH9, O-BELG, London-Brussels, 13.00-15.46, M., 2, Catta.
M.A., Breguet, F-CMAK, London-Paris, 15.05-18.05, Nil, Nil, Portal.
M.A., Spad, F-ACMD, London-Paris, 16.09-18.40, Nil, 3, Le Men.
M.A., Spad, F-CMAV, London-Paris, 16.20-18.45, Nil, Nil, Le Sec.
M.A., Spad, F-ACMG, Paris-London, 10.10-12.21, G.M., 5, Rauge.
S.N., DH9, O-BIEN, Brussels-London, 11.59-14.17, G.M., 2, Sahnovsky.
G.E., Goliath, F-FHMU, Paris-London, 13.10-15.30, G., 10, Labouchere & 1
K.L., Fokker, H-NABN, A'dam-London, 14.00-17.02, G.M., 2, Olley.
M.A., Breguet, F-CMAC, Paris-London, 12.50-15.14, G.M., Nil, Donelin.
M.A., Breguet, F-CMAD, Paris-London, 16.35-19.10, M., 3, Perignon.
H.P., HP, G-EATM, Paris-London, 11.00-14.00, Nil, 10, Wilcockson & 1

#### MAY 26th:

M.A., Breguet, F-CMAM, London-Paris, 10.00-12.45, G., Nil, Briere.
K.L., Fokker, H-NABN, London-A'dam, 11.24-17.42, G.M., 2, Holmes.
S.N., DH9, O-BIEN, London-Brussels, 12.25-14 53, G.M., 2, Sahnovsky.
G E., Goliath, F-FHMU, London-Paris, 12.48-15.50, G., 12, Labouchere & 1
M.A., Spad, F-ACMG, London-Paris, 16.05-18.30, Nil, 1, Rauge.
M.A., Breguet, F-CMAB, Paris-London, 09.40-12.25, G.M., 3, Delage.
I.L., Vimy, G-EASI, Paris-London, 11.20-13.47, Nil, 11, Chattaway.
I.L., Bat, G-EAPK, Paris-London, 11.24-13.45, Nil, 4, Powell.
G.E., Goliath, F-GEAC, Paris-London, 12.25-15.49, G., 11, Bechler & 1.
M.A., Spad, F-CMAV, Paris-London, 12.58-15.30, G.M., Nil, Delily.
M.A., Spad, F-ACMA, Paris-London, 16.30-19.35, G.M., 4, Paille.

#### MAY 27th:

K.L., Fokker, H-NABH, London-A'dam, 10.20-13.56, G.M., 2, Olley.
M.A., Breguet, F-CMAD, London-Paris, 10.24-12.55, G., 1, Perignon.
M.A., Breguet, F-CMAC, London-Paris, 10.24-12.47, Nil, 3, Donelin.
I.L., Vimy, G-EASI, London-Paris, 12.35-15.36, G., 10, Barnard.
I.L., DH18, G-EARO, London-Paris, 12.35-15.05,M., 6, Powell.
G.E., Goliath, F-GEAC, London-Paris, 12.35-15.36, G., 10, Bechler & 1.
M.A., Breguet, F-CMAB, London-Paris, 16.28-18.50, Nil, 3, Delage.
M.A., Spad, F-ACMA, London-Paris, 16.30-19.00, Nil, 3, Paille.
M.A., Breguet, F-CMAM, Paris-London, 09.35-12.40, G.M., 2, Briere.
H.P., HP, G-EATN, Paris-London, 11.05-14.26, G., 8, Wilcockson & 1
S.N., DH4, O-BARI, Brussels-London, 12.05-15.00, G.M., 2, Delzenne.
M.A., Spad, F-ABHP, Paris-London, 12.43-15.16, G.M., Nil, Le Sec.
K.L., Fokker, H-NABQ, A'dam-London, 14.45-17.54, G.M., 2, Duke.
M.A., Spad, F-ACMF, Paris-London, 16.40-19.30, M., 4, Challoux.

#### MAY 28th:

K.L., Fokker, H-NABQ, London-A'dam, 10.15-13.55, G.M., Nil, Duke.
M.A., Spad, F-CMAV, London-Paris, 10.19-12.20, Nil, 1, Delily.
M.A., Spad, F-ABHP, London-Paris, 11.55-14.05, G., Nil, Le Sec.
S.N., DH4, O-BARI, London-Brussels, 12.30-14.30, G.M., 2, Delzenne.
G.E., Goliath, F-FHMY, London-Paris, 13.37-16.15, M., 12, Labouchere & 1
G.E., Goliath, F-GEAB, London-Paris, 15.47-18.20, Nil, 6, Favreau & 1.
M.A., Breguet, F-CMAM, London-Paris, 16.00-18.17, G., 2, Briere.
M.A., Spad, F-ACMF, London-Paris, 16.20-18.50, G., 3, Challoux.
G.E., Goliath, F-GEAB, Le Crotoy-Ldn, 11.00-13.38, G.M., 4, Favreau & 1
I.L., Vimy, G-EASI, Paris-London, 11.45-14.47, G., 11, Powell.
S.N., DH9, O-BELG, Brussels-London, 12.35-15.35, G.M., 2, Catta.
M.A., Breguet, F-CMAC, Paris-London, 13.15-16.10, G.M., Nil, Donelin.
M.A., Breguet, F-CMAD, Paris-London, 16.30-19.20, G.M., 4, Paille.

#### MAY 29th:

I.L., Bat, G-EAPK, London-Paris, 11.06-13.32, G., Nil, Powell.
I.L., DH18, G-EARO, Paris-London, 11.10-13.45, G., 5, Barnard.
K.L., Fokker, H-NABH, Rotterdam-London, 11.10-14.35, G., Nil, Holmes

### The Air Port of Cricklewood.

#### MAY 23rd:

H.P., HP, G-EATN, Paris-London, 11.30-14.40, Nil, 5, Perry & 1.
H.P., HP, G-EATK, Paris-London, 11.30-14.43, G., 6, McIntosh & 1.

#### MAY 24th:

H.P., HP, G-EATM, London-Paris, 12.00-15.15, G.M., 10, Wilcockson & 1

#### MAY 25th:

Incoming machine landed at Croydon.

#### MAY 26th:

H.P., HP, G-EATN, London-Paris, 12.00-15.25, G.M., 10, Wilcockson & 1

#### MAY 27th:

Incoming machine landed at Croydon.

#### MAY 28th:

H.P., HP, G-EATK, London-Paris, 11.55-15.00, Nil, 10, Rogers & 1.
H.P., HP, G-EATM, London-Paris, 12.00-15.06, G., 10, McIntosh & 1.

#### MAY 29th:

NIL.

Cricklewood closed from now as an air Port. Handley Page Transport will operate in future from Croydon.

### Inland Flying at Croydon.

May 23rd.—R.A.F. Bristol from Henlow return (Hope); I.L., Vimy test (Barnard); S.F., Avro joy-rides (Muir).

May 24th.—S.F., Avro joy-rides (Muir);

May 25th.—De Havilland Co., DH9, Stag Lane return (De Havilland); C.A., DH18 to Stag Lane (Hatchett); H.P. HP to Cricklewood (Wilcockson).

May 26th.—S.F., Avro joy-rides (Muir); I.L., DH18, test (Barnard); K.L., Fokker, test (Olley).

May 27th.—Nil.

May 28th.—G.E., Goliath, test (Labouchere); I.L., Bat, Stag Lane return (Chattaway); S.F., Avro, joy-rides (Muir); R.A.F., Bristol Kenley return (Baker).

May 29th.—S.F. Avro joy-rides (Muir); L.A.S., Leatherhead return Avro (Ortweiler).

### Inland Flying at Cricklewood.

May 23rd.—Nil.
May 24th.—B.A., Avro from St. Albans (Robinson).
May 25th-26th.—Nil.
May 27th.—H.P., HP from Croydon (Wilcockson).
May 28th.—R.A.F., DH9, from Gosport (Trevethan).
May 29th.—Nil.

## Air Port Statistics.

### CONTINENTAL.

Machines, 89; Passengers, 350; Crews, 106; Total Personnel, 456.
Corresponding week, 1920:—
Machines, 91; Passengers, 138; Crews, 98; Total Personnel, 236.

## The London Terminal Aerodrome.

The number of passengers travelling by air continues to mount up and extra machines are being continually put on to deal with these.

The new petrol reservoir which has been constructed for Basil S. Foster Ltd. is now practically ready for use. It had been hopefully rumoured that for the inauguration ceremony the reservoir, which has a capacity of 2,880 gallons, was to be filled with a nectar not unconnected with hops which was then to be tested by the aerodrome staff.

This is apparently incorrect. Messrs. Basil Foster and Shaw will carry out this test alone. Mr. "Sammy" Hall has obtained the cinema rights and Mr. Brenard has been appointed Poet Laureate for the occasion. At least so one is told.

On Saturday morning Mr. Piercy, now returned from an European tour, brought out a Martinsyde F.4 from the Aircraft Disposal Company and after a spectacular take off executed some wonderful rolls, etc., finally after showing off the speed of the machine across the aerodrome he landed at about "Avro landing speed" opposite the "Disposal" hangars.

Soon after Mr. Baker came in on Lt.-Col. Blandy's new Bristol, making a very pretty landing.

On Sunday Mr. Chapman's Avro arrived about tea time.

### The R.33.

On the previous Friday the R.33, with her registration number G-FAAG now visible, visited the aerodrome apparently to inspect her mooring mast now under construction in the north-west corner of the old service aerodrome. She made a couple of circuits of the aerodrome at a comparatively low altitude with her engines just ticking over. Although she seemed to be moving very slowly, she made the 100 odd miles from Pulham in just about two hours.

One hopes that one will not further incur the probably just wrath of A.F. de M. and his fellow-conspirators if one says that one of the uses of the ship at Croydon when attached to the mooring mast will be that of a wind indicator or "stocking." One does not pretend that this will be her most useful function, very far from it, because the scheme for which these ships are to be used seems really to be extremely sound.

### The Instone Air Line.

The "Vimy" and the D.H.18 G-EARO are still doing their full share of the week's work and the "Bat," now christened the "City of Newcastle," has also been on the service as an "overflow" machine.

Mr. Dudley Tennant, the artist, is doing a series of oil paintings and water colours for the Instone waiting-room. Already three pictures are in position, one being a general view of the aerodrome from Purley with the "Vimy" doing one of Mr. Barnard's well-known steep climbs in the foreground.

On Thursday Mr. Tennant was receiving criticism from pilots and others connected with aircraft, who naturally tried to find all the faults possible in the machines. This however was exactly what Mr. Tennant wanted, as he pointed out that he could only improve his pictures if he was criticised, as he naturally could not be expected to see all the technical errors in the depicted aircraft himself.

Would that certain alleged aircraft artists would do likewise.

The same afternoon one had a flight in the D.H.18 (G-EARO) with Mr. Barnard lasting for about 45 minutes, during which certain specified engine tests were carried out. The flight was made at a height of about 3,000 feet, during which Sutton, Cheam, Purley, Norwood and the Crystal Palace were visited.

On Sunday the "18" came in from Paris after an obviously rough journey. In spite of a stiff head wind Mr. Barnard made excellent time.

Earlier in the week, when Mr. Powell came in from Paris on the "Bat" he made one of the prettiest and slowest landings one has ever seen on this type of machine.

The "Bat" went to Stag Lane and back with Mr. Chattaway on Saturday.

### The Surrey Flying Services.

Mr. Muir and Mr. Grant have now decided to run a flying school in connection with the S.F.S. at Croydon. Some 80 h.p. Le Rhône Avros will be obtained and fitted with dual control. The present arrangement is to charge pupils £10 10s. per hour for dual instruction with extra charges for solo flights. Stunting will also be part of the instruction. This seems to be a thoroughly sound idea.

The second machine G-EAWI was still in dock on Sunday and has been held up by non-delivery of a proper diagonal for the engine bearers. The machine should be out almost at once as it is required to-day (Wednesday) to take some cinema pictures of a horse race at Epsom on that day.

On Sunday Mr. Muir gave another charming lady her *bapteme de l'air*. She appeared to enjoy thoroughly the "falling leaf" and "stall turns," in which Mr. Muir subsequently indulged.

After this display numerous quite ordinary passengers were carried until eventually the tail-skid retired under the strain. This was quickly repaired and the machine was again out after tea carrying on.

### The Flying Dutchmen.

Mr. Leverton's machines continue to hop out of Holland and will do so twice daily from to-day (Wednesday) and in future. The cabins of the machines have been found most useful by ladies visiting the sheds as they contain those indispensable (to femininity) articles, looking glasses.

"Simple hydrostatical" conversations around the Fokker have been very common during the week. Perhaps one should say "frequent" rather than "common."

Mr. Leverton is fancied in the lawn tennis singles championship of the aerodrome. One is told that he was playing very well last week and in future he will be assured of an audience. One uses the word "audience" advisedly.

### Handley Page Transport.

It seems very strange to refer to H.P.T. in the Croydon notes, but the fact remains that this line have at last made the promised journey to the promised land.

Mr. Wilcockson arrived on the first machine on Wednesday last, but the suddenness of it all appeared to be too much for those who rule at Cricklewood, and, on landing at Croydon, he was recalled to Cricklewood, whither he journeyed forthwith. Here, however, he tarried but a while.

And it came to pass that on the following day he started off to Paris, where he duly arrived, and some time later he rose again and descended into Croydon. And behold this time it was so. And the machine it remains there unto this day, unless, as is most probable, it is pursuing its way with the other machines on the regular daily services.—G. D.

## Kettering.

The following cutting from the pen of one who has the pluck to sign his name, Kendal Brown, at its head, appeared in a Kettering paper, and deals with the doings of the Berkshire Aviation Co., who were flying from the Headlands there a week or two ago. It is headed "The Art of the Birdman."

"On arriving at the Berkshire Aviation Company's Aerodrome at the Headlands the other day, I found everything ready for my first flight in the air car. Naturally I was anxious to catch a glimpse of the pilot with whom, for a few brief moments, I was to entrust my life. All fears were immediately banished on beholding his jovial countenance; and his complete mastery of the arts of the birdman were only too apparent as he strutted round the airplane—after indulging in his morning game of 'footgoals.'

"And now for the flight. On receiving the word from the assistants I mounted the ladder, and found myself comfortably seated in one of the buckets used for the passengers' convenience, and before I could say 'hey presto' the command 'Contact' rang out, the propellers commenced to revolve, and the huge 'plane ambled its way across the 'drome. The petrol was then turned on and the starting handle pulled back. The hissing monster, issuing its challenge to the air, soared up into the blue with its living freight—hedges, trees, houses and clouds rushing past in one mad whirl. Droning our way round the church spire, the machine winged its course over the *Guardian* offices—where the pilot in charge indulged in a little side-flying and tail-slipping. Soon the air car started to pitch, and in a graceful bird-like swoop dropped on the aerodrome amidst the applause of the onlookers."

That the above drivel did not affect the appetites of the "birdmen" is apparent from the following, also clipped from the same source of information.

"Last Thursday evening we had occasion to call upon the airmen who are giving exhibition flights from the Headlands. We arrived at the George Hotel just as they had sat down to tea. Our visit being one of business, consequently would not brook delay. We talked while they consumed what they delicately termed 'a collation.' In front of us were three men, fifteen eggs, a loaf of bread, butter, and three dishes of stewed fruit."

The Berkshire Aviation Co. are at present flying at St. Albans, where they are doing very well in spite of the fact that the R.F.C. and R.A.F. Sqaudrons stationed at London Colney Aerodrome during the war must have "vulgarised" the local inhabitants pretty thoroughly.

## Woking.

One is given to understand that the machines which Martinsyde Ltd. exhibited at the last Aero Show have been sold by them. These comprised the "Semiquaver," F.4a two-seater, and "A" type commercial machine The Handasyde

Aircraft Company, one is informed, have acquired the "Semi-quaver." To all intents and purposes the former firm have abandoned the construction of aeroplanes.—J. F. S.

## CROYDON AS A SOCIAL CENTRE.

The following letter has been received :—

5, Oak Hill Park, N.W.3.

Sir,—Your appeal for Croydon Airport, though no doubt condemned to be disregarded by our aviatic Dillies and Dallies, is certainly quite right in principle; but it is difficult to share your optimism in expecting a Government Department to prepare accommodation for the umpty thousand Aerial Derby spectators in a brief two months

Also, whatever makes you expect the R.Ae.C. Committee to consider so sensible a project? True, most of its members were once keen and practical supporters of all things aviatic, but their post-bellum record of mental paralysis almost precludes any hope of good work from that quarter.

No, this year's events will be held at Hendon—bad though its surface and unaeronautic its present associations. For myself, living near Hendon, I shall rejoice; but there is no shadow of doubt that the venue should be Croydon, which is the only existing centre of the aviatic community near London—and by far the greatest one in these islands.

If only the R.Ae.C. would give ear to your suggestions for making Croydon the Centre of British Aviation, notably by pleasant Sunday (why not also Saturday?) afternoons—they may be quite sure that the Untutored Mob, as well as the mere enthusiasts, will blow in in swarms.

Which will be of immense value to Aviation, and very cheery for all concerned. Again many thanks for that article —more power to your elbow!

To leave sport and turn to commerce, when will the British Air Line people start running to time, and with more regard for safety than is indicated by Mr. Gladstone's letter of a few weeks ago? When they do this, one will be able to "propagand" one's aviatically ignorant friends and acquaintances with a great deal more effect. One can hardly urge people to pay extra for the use of a service which thinks little of being half an hour or more behind time.

(Signed) CHARLES A. N. MORRIS.

## OUR BUSY WIRELESS.

Onward House, Appledore, Kent,
May 22nd, 1921.

Sir,—I have a wireless receiver and I often listen to the Radio-Telephony between Lympne, Croydon and the Handley Pages.

Chancing to switch over to 900 metres this morning I heard the following :—One, two, three, four, five, six, seven, eight, nine, ten, ten, nine, eight, seven, six, five, four, three, two, one, a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z. Then followed a delightful rendering of "Bubbles" whistled by the operator.

Then—Hello, hello, hello, is that enough please? Croydon changing ovah!

I may say I am surprised at the operator whistling such a tune on a Sunday.

(Signed) W. E. PHILPOTT.

[One is surprised that Mr. Philpott should listen to a private conversation.—Ed.]

## PERSONAL NOTICES.

**[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE. There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]**

DEATH

PINCKNEY.—On May 25th, accidentally killed flying in Hampshire, Philip John Pinckney, of Buenos Aires, son of the late Capt. Philip Pinckney (Carabiniers), brother of Mrs. Herbert Curtis, Buckland Manor, Lymington, and Mrs Arthur Pinckney, aged sixty.

ENGAGEMENTS.

BARTLETT—AIKEN-SNEATH.—The engagement is announced between Capt. C. P. O. Bartlett, D.S.C. and Bar, R.A.F., son of the Rev. C. O. Bartlett, of Minsterworth Vicarage, Glos., and Joan Aikin-Sneath, daughter of Mr. F. Aikin-Sneath, J.P., of Tibberton Court, Glos.

BATEMAN—BLANC.—The engagement is announced between Capt. P. Bateman, London Irish Rifles and R.A.F., son of the late Alfred George Bateman, Feltham Court, Middlesex, and M. L. Blanc, eldest daughter of Mme. Irene Procopiu, Lady in Waiting to H.M. the Queen of Roumania.

MONCUR—SARGENT.—The engagement is announced between Corporal David M. Moncur, R.A.F., eldest son of Mr .and Mrs. D. Moncur, of Pollokshields, Glasgow, and Clara Winifred, only daughter of the late Captain W. Sargent and Mrs. C. Sargent, Oreston, Plymouth.

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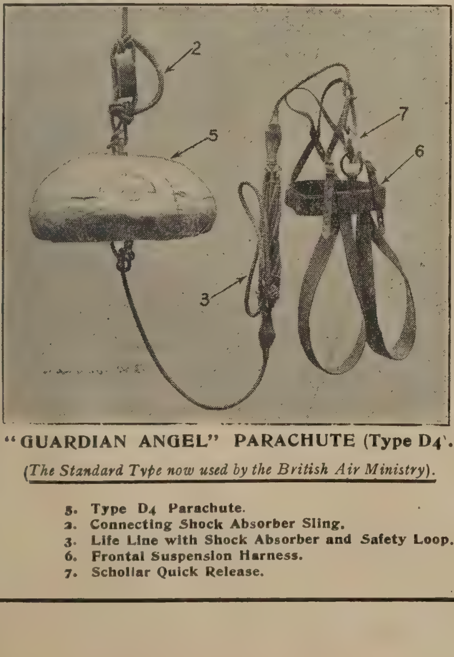

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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... 515
Aircraft Disposal Co., Ltd., The ... 502
Armstrong Siddeley Motors, Ltd. ... 507
Arrol-Johnston, Ltd. ... *Front Cover*
Auster, Ltd. ... *Front Cover*
Bristol Aeroplane Co., Ltd. ... 507
British Thomson-Houston Co., Ltd., The ... 502
Calthrop, E. R., Aerial Pat., Ltd. ... 515
Cellon, Ltd. ... *Front Cover*
Cunard Line ... 516
De Havilland Aircraft Co., Ltd., The... 509
Fairey Aviation Co., Ltd., The ... 501
Hancock, James Lyne, Ltd. ... 516
New Pegamoid, Ltd. ... 516
Nieuport and General Aircraft Co., Ltd. ... 509
Roe, A. V., & Co., Ltd. ... *Inside Front Cover*
Short Bros., Ltd. ... *Back Cover*
Titanine, Ltd. *Front Cover & Inside Back Cover*
Westland Aircraft Works... 505

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JUNE 8, 1921.

# THE AEROPLANE

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## ON TEN YEARS OF "THE AEROPLANE."

On June 8th, 1911, there appeared the first issue of a comic-looking little paper bearing the title The Aeroplane. By a curious coincidence due to leap-years and the alteration of the day of publication the tenth birthday of the aforesaid comic publication falls on its publishing day. Consequently to-day's issue marks the end of the first ten years of The Aeroplane.

To-day The Aeroplane is again a little paper, having returned to an attenuated size owing to the natural post-bellum slump in general trade coinciding with an artificial coal strike which has turned the ordinary trade depression into something very like a national disaster. The inevitable result has been that just when Civil Aviation has most needed financial support with which to develop commercial air transport, nobody has had any money with which to support aviation. And as there is no money forthcoming for Civil Aviation naturally those firms which manage to exist in the Aircraft Industry have very little money to spend in supporting the aeronautical Press.

It must be remembered that in these days no paper can exist on its circulation. It is the advertisements which keep every paper alive. Consequently the unfortunate editor has to cut his coat according to his cloth. In other words, the number of pages of reading matter has to be kept rigorously in proportion to the number of pages of advertisements. So far as Aviation is concerned the effect of this first law of newspaper nature is truly lamentable, for to-day, although there is apparently a slump in flying judged by the war-time standard, there is in fact more about which to write and more matters of vital importance about which a great deal ought to be written for the good of the future of aviation than there has ever been.

It would in fact be necessary to have a paper approximately three times the size of The Aeroplane if one were to attempt to deal adequately with the various branches of aeronautics such as (a) the politics of aviation, (b) the news, internal affairs and official gazettes and notices of the R.A.F., (c) technical news, notes, and arguments, (d) trade news and descriptions of new machines and equipment, (e) foreign military and naval news, (f) foreign news of civilian flying, (g) sporting flying such as competitions and record flights at home and abroad, (h) civil air traffic news, arrivals and departures, and operations of commercial aerial transport firms, (i) personal notices, official notices from clubs, societies, associations, and so forth.

From this it may be judged how utterly impossible it is for any paper to hope to do what ought to be done for the development of British Aviation while trade is in its present state. As it is one merely does the best one can under the circumstances.

### Wanted: A Millionaire.

But if any reader happens to know of any wealthy person who is prepared to spend £5,000 a year for the good of British Aviation for the next three years one will be glad to meet him. It would not be difficult to prove that by spending approximately £100 a week on mere paper and printing, so as to make it possible to publish all the aeronautical news that ought to be published, such a man could do more to help the progress of flying than can all the Government subsidies and propaganda departments and than all the aeronautical leagues and societies and clubs and such associations.

So far as one can discover the only people who are making anything out of aeronautical journalism to-day are the printers, as may be judged by the fact the one has to pay for the mere mechanical operations of printing, apart altogether from paper or publishing or editorial or office costs, a matter of £80 per week for work which in 1915 cost approximately £25 per week. Of course one is glad to see the lot of the British working man improved, and one would gladly pay double the amount if the income of the paper would stand it, even though the shareholders (the bloated capitalists!) get nothing per annum, as has been their lot for seven out of the ten years of The Aeroplane's life. But one does wish, for the good of Aviation, that one could increase the size of the paper in the proportion of 25 to 80. It might be possible then to deal almost adequately with aeronautical events of the day.

### "The Aeroplane's" Reward.

Despite all these drawbacks and difficulties the Staff of The Aeroplane have their reward in the appreciation which their hampered efforts receive from the people most concerned. Letters from all over the World bear witness to the welcome which the paper receives and to the entirely undeserved reputation for omniscience which its Staff seems to possess. A Colonial (or should one say "Dominion"?) air authority asks for criticism of its regulations; a "Sovereign State" of the U.S.A. asks for information about air laws; a British South African Co. official in the wilds of Northern Rhodesia says how much the farmers on whom he calls and the men in the clubs in the local towns enjoy reading The Aeroplane; an Air Ministry official sends an indignant message because the Post Office has forgotten to deliver his weekly copy of the paper; a corporal of the R.A.F., almost time-expired, asks for advice about getting a ground-engineer's certificate; a civilian aviator (lately an officer R.A.F.) in a British Colony asks The Aeroplane to raise a row because his Government does not regulate civil aviation properly and a paragraph from this paper quoted in the Colonial papers will help the campaign for proper legislation; a French official organisation asks for back numbers of The Aeroplane so that it may possess a complete set of the war issues; a German paper comments on the fairness and impartiality with which the German aircraft industry has been treated; and so forth and so on.

Every country, except perhaps Bolshevik Russia, at one time or another has asked for some sort of help from The Aeroplane, and has got it. One is indeed fortunate in having a Staff which between them possess or can acquire all the multifarious oddments of information desired. There is also encouragement to be had from the equally world-wide attacks which are made on this paper. It is true that one has not apparently as many personal enemies as formerly, and one grieves over their loss. We are all enjoined to love our enemies, and personally one loves one's enemies so much that one has made a hobby of collecting them. The apparent decrease in their numbers gives one to fear that one is losing one's sting. But after all it may be only that the theories for which one used to be hated have turned out to be true.

Nevertheless it seems that instead of having a number of personal enemies, chiefly perfectly good Britons, in Government circles at home, one is now extending one's circle of hostility to assorted gentlemen of alien race both at home and abroad, even if the actual number of enemies has decreased. So evidently there is still hope. Nothing is quite so dull as a peaceful life.

### "The Aeroplane's" Foundation.

The foundation of The Aeroplane was made possible by the generosity and the very practical patriotism of Mr. E. V. Sassoon, later Captain R.A.F. and now something of a power in India. Unfortunately he had to sever his connection with aviation and the existence of the paper was saved by Mr. E. W. Edwards of Morgan and Co., now associated with R. E. Jones Ltd. of more recent fame. Later again the financial support of The Aeroplane was assured by its publishers, William Dawson and Sons Ltd., to whose Directors one owes a very great debt of gratitude not only for the said financial support but for the absolute freedom which one has been allowed in conducting (or as some may think in misconducting) this paper. Few editors can have had such pleasant relations with their directors as have fallen to one's own lot.

Unfortunately owing to the fact that the pre-war standard of profit of The Aeroplane was of an entirely negative nature all the war profits of this paper had to be paid out as Excess Profits Duty except a very small percentage which had to be used as working capital, and that is now being expended in trying to keep the paper up to a level which will allow it to deal fairly well with aerial developments, though, as already stated, it is quite impossible to do so adequately. Therefore the financial supporters of the paper have never yet had their reward. That reward will come when in the near future Civil Aviation becomes a commercial proposition.

### "The Aeroplane's" Staff.

As to the Staff, one is particularly fortunate in having as Technical Editor and chief assistant in general, Captain W. H. Sayers, who was a member of the Staff in 1913-14 and left to join the R.N.A.S. immediately war was declared. His war service has permanently injured his bodily health, but his mental powers have increased with age and experience, so that his technical writings in this paper since the war have added materially to the high reputation as an aeronautical engineer which he had made for himself at the Air Ministry during the latter part of the War.

Also one has had the good fortune to secure the services of Mr. Leonard Bridgman, another R.A.F. invalid, who has made for himself a name as one of the finest aeronautical artists in this or any other country. Not only can he do a first class mechanical drawing but he is equally capable of the best black-and-whte sketches, or of pictures in water-colours or oils which are at once full of life and technically accurate, a most unusual combination of abilities. And he can write a description of an event or a mechanical apparatus better than any trained journalist. It is a continual regret that the restricted pages of THE AEROPLANE prevent one from publishing Leonard Bridgman's pictures as coloured supplements. But that is a pleasure to come when this paper is again affluent.

The last-joined member of the Staff is Mr. Geoffrey Dorman, who has also been invalided at various times from various branches of the R.F.C. Having been a pilot of almost all types of aircraft of war, including long and short-horn Maurice Farmans, Fee-planes, Kite-balloons, parachutes, Camels, and other fearsome mechanical wild-fowl, it is natural that, following the law of contrariness, he should devote himself to Civil Aerial Transport. If the civility of the paragraphs signed G.D. is sometimes to seek that is merely his little way. It will be admitted by both his friends and his enemies that few people who have written on aviation have had a finer faculty for acquiring news or a finer facility for using it when acquired. One has great hopes of G.D. in the future if he escapes assassination at the hands of some person from or about whom he has extracted information,.

Major W. E. de B. Whittaker, who was associated with this paper before the war, and has been "Chief of Staff" since he left the Army as a G.S.O.2 in 1919, has recently left and has been appointed to a very responsible post not exactly "in the City," but something between that and the "West End," in which his notable organising power should find far greater scope than was possible for them in this paper as now limited by circumstances over which none of us have any control. Nevertheless, one hopes still to be able to consult him on those eclectic subjects of which he has such extensive and curious knowledge. Those who have enjoyed his peculiarly sardonic humour or have benefited by his good advice so freely given, especially to young officers, will wish him well in his new responsibilities.

One desires also here to express one's thanks to those energetic young women who do the clerical work of the paper and endeavour to maintain a state of order amid the chaos caused by the literary efforts of the mere men aforementioned. It is to their diligence and to their carefulness in filing and to their intelligent memories for where references can be found that the multitudinous enquirers for information get what they require. And it is entirely thanks to their willingness to work early and late that the correspondence concerning all that information ever gets itself done. One hopes that it may be possible to reward them adequately when this paper returns to something like the prosperity which it enjoyed during the late lamented War.

### A Personal Note.

For oneself, one has had the reward of seeing aviation develop from almost nothing ten years ago, when there were no Flying Services and when every aeroplane was an experiment, to the stage during the War when British aviators held the undisputed Command of the Air, when British aeroplanes were admittedly the best designed and best built in the World, and when aircraft material was made on mass-production principles.

Week by week during these ten years one has written this leading article in THE AEROPLANE without missing a single issue, despite ill-health and weariness. On the whole these articles have pleased where they were intended to please and have offended where they were intended to offend . That is to say they reached their objectives, as did the British Army during the War. And all the objects for which they were written have been achieved or are in course of being achieved.

### The Great Objective.

The chief objective for whose achievement this paper carried on its operations, nefarious and otherwise, has been the building up of the Flying Services. Ever since the R.F.C., with its Naval and Military Wings, came into existence THE AEROPLANE has laboured, openly and by intrigue, to make those Services the best equipped, best disciplined, and most powerful of their kind in the world.

That object has now been attained. To-day the R.A.F. is the premier aerial fighting force of all nations. There may be one or two which are bigger but there is none so experienced, so well disciplined and so well equipped. And the smartness of the peace-time R.A.F. on the ground is worthy of the Senior Services..

So far as the R.A.F. is concerned one is almost ready to sing the "*Nunc dimittis.*" But one wants to live to see the American-Japanese War, and if possible the War of the Slavs against Europe. Also one wants to see Civil Aviation a proved success before going for the long rest.

### The Present of British Aviation.

If to-day the outlook for British Aviation seems black to some, it is not nearly so black as it deserves to be. Thanks to well-judged distribution of orders by the Air Ministry the Aircraft Industry is being kept alive when if it had been left to its own commercial acumen it would have been stone dead and buried. With its recent bitter experiences the Industry is acquiring sense and in a very few years it will develop once more into a great industry.

We have still in this country the best designers of aircraft in the World, and the World knows it. There is significance in the fact that official returns of exports show that for the month of April aeroplanes and locomotives are the only two classes of goods which show an increase over the corresponding month last year. That is only the beginning of a movement.

Civil Aerial Transport figures, which have been putting up new records week after week lately, indicate what we may expect in the future when we have air lines equipped with real commercial aeroplanes run as commercial propositions without the enervating influence of Government subsidies to promote inefficiency. And one does not believe that we shall have long to wait for these developments.

### "The Aeroplane's" Future

Though this is in fact the tenth birthday of THE AEROPLANE the 20th Half-Yearly Volume does not end till the issue which appears on the 29th of this month. Therefore in a way the Eleventh Year of THE AEROPLANE will begin with the first issue of the 21st Volume on July 6th. Some few slight alterations will be made in the paper, with the idea of making it look more attractive to those who are apt to judge a man by his overcoat, but who are none the less people whom one desires to interest in flying for the good of Aviation. Otherwise there is no intention of altering anything material.

It is, however, the intention of the proprietors to improve the paper as soon as ever opportunity occurs. They have no desire to make a profit out of THE AEROPLANE till the Aircraft Industry can stand it. They could make a profit to-day by getting rid of the Staff and running the paper with an editor, one typist and the help of a Press Cutting Agency. Instead they prefer to lose money and maintain the usefulness and influence of the paper.

As the Aircraft Industry grows and can afford to advertise more extensively the proceeds will be spent on giving more and more pages of reading matter and illustrations so that readers all over the World will find the paper more and more useful. Thus and thus only can one feel that one is doing one's duty by British Aviation.

Meantime, if any reader of this paper wants any more information on any subject than appears in the paper itself, he or she is cordially invited to write and ask for it. The Staff inevitably spends more time acting as an Aeronautical Enquiry Bureau than in producing THE AEROPLANE, and the more enquiries arrive the better everybody is pleased

One can only hope that at the end of the next decade one may have the pleasure of congratulating the Royal Air Force (or the King's Flying Services as they may be by then) and the British Aircraft Industry on having made as much progress proportionately as they have done in the past decade. If one has that good fortune one will be able to feel that life has not been wasted.—C. G. G.

## CONGRATULATIONS.

The following notice appears in the Personal Notes :—

> "On June 6th, at Dancers Hill House, Barnet, Herts, the wife of Air Marshal Sir Hugh Trenchard, of a son."

All who are concerned with Service Aviation will join in sincere congratulations to Sir Hugh and Lady Trenchard, and in good wishes for the future of their son and heir.

**Telegraphic Address**
*Adresse Télégraphique:*
Dirección Telegráfica:
**"AIRILY, HAYES, MIDDLESEX."**

**Codes:**
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**A.B.C. (5th Edition).**

# The Fairey Aviation Company,
LIMITED.

**CONTRACTORS to BRITISH ADMIRALTY, WAR OFFICE and AIR MINISTRY.**
*Fournisseurs des Ministères de la Guerre, de la Marine et de l'Air.*
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**Sole Patentees of the Fairey Patent Variable Camber Gear for Aeroplanes, Seaplanes and Flying Boats.**
*Seuls détenteurs du brevet Fairey pour dispositif de cambrure variable pour aéroplanes, hydravions et bateaux volants.*
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**Designers by special request of the largest Flying Boat built for the British Government.**

**Contractors for the laying out and complete equipment of Passenger, Mail and Express Goods Services by Aircraft.**

**Designers and Manufacturers of the Fairey Type III. Series of Machines as supplied in quantity to the British Government during the War and since its termination. In this series of Machines the Fuselage, Centre Plane, Tail Unit, etc., are standard and are adapted to take different types of wings chassis and engines of other Machines of the series to suit the particular purpose for which the machine is required. All machines of this type have folding wings and are fitted with our patent Variable Camber Gear giving high performance and lifting power combined with low landing speed.**

*Constructeurs de toutes espèces d'hydravions, bateaux volants, aéroplanes, appareils amphibies, avions spécialement aménagés pour levées topographiques et photographiques, hangars flottant et équipement complet pour ces derniers.*

*Constructeurs, sur commande spéciale du Gouvernement Britannique, du plus grand bateau volante construit jusqu'à ce jour.*

*Etude et entreprise de la fourniture du matériel complet pour services de transport aérien rapide de passages, courrier et marchandises. Constructeurs des Fairey Type III. Série de machines fournies en grandes quantités au Gouvernement Britannique pendant la guerre et depuis la cessation des hostilités. Dans cette série de machines, le fuselage, le plan central et la queue, etc., sont standardises, et sont construits de manière à pouvoir recevoir des ailes des types différents, ainsi que des châssis et moteurs d'autres machines de la série, de manière à être appropriés à l'usage auquel la machine est destinée dans chaque cas particulier. Toutes les machines de cette série ont des ailes démontables et repliables, et sont munies de notre dispositif breveté de cambrure variable, qui permet les plus grandes performances et qui combine une grande puissance de soulèvement avec une faible vitesse d'atterrissage.*

Diseñadores y constructores de hidroaviones, barcos aéreos, aeroplanos, aparatos anfibios, de todas clases, tambien de apartos especialmente adecuados para el levantamiento de cartas topográficas y fotografias, hangares flotantes y completo equipo para estos mismos.

Diseñadores, á pedido especial del Gobierno Británico del barco aéreo mas grande que se ha construido para este gobierno.

Proveedores de todo lo necesario para servicios de transporte aéreo de pasajeros, correos y mercancías.

Diseñadores y constructores del tipo Fairey III. Serie de aparatos suminstrados en cantidad al Gobierno Británico, durante la guerra *y después de su terminación.* En esta serie de aparatos, el fuselage, el plano central y la unidad de la cola, son standard y fabricados para adaptarse á diferentes tipos de alas, chassis y motores de otros aparatos de series que sean adecuadas para ejecutar los fines particulares para los cuales se requiera el empleo del aparato. Todas las máquinas de este tipo, tienen alas plegadizas y eatán provistas del dispositivo patentado de combeo variable Fairey que da una alta performance y potencia de ascensión combinada con una velocidad baja de aterrisaje.

# THE BIRTHDAY HONOURS.

His Majesty the King has been pleased on the occasion of his birthday to confer the honour of Knighthood on Henry White Smith, Chairman of the Society of British Aircraft Constructors, and on Samuel Instone, of S. Instone and Co. Ltd.

Sir Henry White Smith is one of the true pioneers of British Aviation, having been appointed secretary to the British and Colonial Aeroplane Co. Ltd., now the Bristol Aeroplane Co. Ltd., at the formation of that firm by his uncle the late Sir George White, Bart., in 1910. The Bristol Co. was the first firm in this country to be formed for the sole purpose of manufacturing aeroplanes on a commercial basis and those concerned with it have thoroughly deserved every success which has fallen to them.

When the S.B.A.C. was formed Mr. White Smith was elected Chairman and throughout the War he filled that difficult post with the greatest tact and judgment He restrained the hotheads who were disposed to quarrel with the High Authorities and on the other hand he persuaded the Authorities to take a reasonable view of the demands and difficulties of the Aircraft Industry. He has never played for popularity as he might easily have done, but he has made a high reputation for himself by talking sound common sense and using his influence to promote peace and progress.

In conferring this honour on Mr. White Smith His Majesty has honoured the British Aircraft Industry, for Sir Henry is truly representative of what is best and soundest in British Industry.

Sir Samuel Instone represents the new generation in British Aviation. He and his brothers, originally Cardiff coal merchants on a large scale, were the first commercial firm unconnected with aviation during the War to see the possibilities of aerial transport. Beginning with a solitary D.H.4 used for the private communication between the firm's offices in London and Paris, S. Instone and Co. Ltd. later acquired a Bristol "Tourer," a Vickers "Vimy" and a B.A.T., and with them ran a public passenger and goods service which became known as the "Instone Air Line."

With the help of a handsome subsidy and the loan on hire of sundry D.H.18s. the Instone Air Line has developed into the most active of British air lines at the moment. It has recently been running sundry special machines in addition to the scheduled service, and fresh developments are incessantly expected.

Among the very few titles borne by those concerned directly or indirectly with Aviation the name Samuel seems to have more than its share, Sir Samuel Samuel and Sir Samuel Waring have already obtained honours of a like nature. May their financial successes be a happy augury for Sir Samuel Instone.

A third Birthday Knight deserves mention in these notes. Sir James Percy, D.L., J.P., of Dublin, partner with Mr. Mr. R. J. Mecredy in the *Motor News, Irish Cyclist* and other excellent papers, has been knighted for patriotic work during the War. He was one of the first men in Ireland to see the future of aviation and he was one of the leading spirits in promoting the two highly successful and wholly enjoyable aviation meetings which were held at Leopardstown in 1912 and 1913. Whatever may have been the good works for which he was knighted "Jimmy" Percy deserves his title for being one of the World's greatest humourists, a fact which is known by all who have met him and may become known to all who will read his two books on "Irish Bulls," the second of which has been only recently published. Congratulations to Sir James J. P.—C. G. G.

# NAVAL AND MILITARY AERONAUTICS.

## Services Fencing Championships.

The following competitions were decided at Olympia during the Royal Naval, Military and Air Force Tournaments :—

Foil v. Foil, Officers, Royal Air Force.—1, Flt. Lieut. F. G. Sherriff, M.C.; 2, Sqdn. Ldr. E. G. H. Clarke, M.C.; 3, Sqdn. Ldr. Rev. J. R. Walkey.

Foil v. Foil, Other Ranks, Royal Air Force.—1, Serjt.-Maj. H. Grainger; 2, Serjt.-Maj. A. W. Stollery; 3, Serjt.-Maj. R. E. Gorwood.

Foil v. Foil (Championship).—1. Serjt.-Maj. H. Grainger; R.A.F.; 2, Captain T. M. Wand Tetley, Wiltshire Regt.

Epée v. Epée, Officers, Royal Air Force.—1, Flt. Lieut. F. G. Sherriff, M.C.; 2, Sqdn. Ldr. Rev. J. R. Walkey, 3, Sqdn. Ldr. H. Ellershaw.

Epeé v. Epée, Other Ranks, Royal Air Force.—1, Serjt.-Maj. H. Grainger; 2, Serjt.-Maj. R. E. Gorwood; 3, A.C.2 E. J. Lampard. (Note.—1, Cup and Medal; 2 and 3 Certificates.)

Epée v. Epée (Championship).—1, Flt. Lieut. F. G. Sherriff; 2, Serjt.-Maj. H. Grainger, R.A.F.; 3, Lieut. C. A. Kershaw, R.N.

Sabre v. Sabre, Officers, Royal Air Force.—1, Flt. Lieut. F. G. Sherriff; 2, Sqdn. Ldr. Rev. J. R. Walkey; 3, Sqdn. Ldr. E. G. H. Clarke, M.C.

Sabre v. Sabre, Other Ranks, R.A.F.—1, Serjt.-Maj. H. Grainger; 2, Serjt.-Maj. A. W. Stollery; 3, Serjt.-Maj. J. Miller.

Sabre v. Sabre (Championship).—1, Serjt.-Maj. H. Grainger, R.A.F.; 2, Lt. C. A. Kershaw, R.N.; 3, C.P.O. W Stamper, R.N.

Bayonet v Bayonet, Officers, Royal Air Force.—1, Flt. Lieut F. G. Sherriff, M.C.; 2, Flt. Lieut. E. P. Roberts; 3, Sqdn. Ldr. E. G. H. Clarke, M.C.

Bayonet v. Bayonet, Other Ranks, Royal Air Force.—1, Flt. Serjt. Scott; 2, Serjt.-Maj. H. Grainger; 3. Serjt.-Maj. C. Edwards.

Bayonet v. Bayonet (Championship).—1, Gunner Duncan, R.M.A.; 2, Colonel R. B. Campbell, D.S.O., Gordon Highlanders; 3, Regt. Serjt.-Maj. Davidson, 2nd Gordon Highlanders; 4, Flt. Lieut. F. G. Sherriff, M.C., R.A.F.; 5, Flt. Serjt. Scott, R.A.F.; 6, Lieut. Benson, R.N.

Champion-at-Arms Dismounted.—Serjt.-Maj. H. Frainger, R.A.F.

## R.A.F. Gymnastics.

Flying Officers Randell and Macdonald, flying from Bristol to Pembroke Dock on Saturday, May 14th, ran into thick mist and turned a somersault on Pembrey Burrows, near Barry Port. Neither officer was injured.

## "A" Naval and 216 Squadron. Independent Force.

The first annual reunion dinner of the officers and other ranks of "A" Naval and 216 Squadron R.A.F was held on May 28th at Frascati's. The number present was 55. Owing to restricted travelling conditions that was short of the number expected.

The Chairman, Major F. T. Digby, D.S.O., D.S.C., said how pleased he was to see so many of the old faces there that night. He said that the organising of such a dinner was really more than one man's job and called for the names of three officers and three men to form a dinner committee, to help in years to come.

Capt. R. Halley, D.F.C., A.F.C., complimented Capt. Harding on arranging the dinner under present conditions.

Capt. E. D. Harding, D.F.C, thanked everyone for their appreciation, and also those who had helped him in the secretarial work.

Capt. H. McCleland, D.S.C., gave some very interesting figures relating to the work of the Squadron whilst in the Independent Force. 216 Squadron was the first night bombing squadron to reach Cologne, Coblentz, Mannheim, Stuttgart, and many other German towns, and dropped a greater weight of bombs than any other squadron in the Independent Force. These raids would have been impossible if the Squadron had not had the very best N.C.Os. and mechanics.

Chief Petty Officer Laverick said how proud all other ranks were to have served in such a Squadron and they never wished to serve better officers. He could not hope to have finer mechanics serving under him. A most successful evening was concluded by the singing of the old "Squadron Song" and the usual "For they are jolly good fellows."

## Mahsud Capital Bombed.

In view of the recent growth of sniping and attacks on convoys in the Wana and Mahsud areas, British aircraft bombed the Mahsud capital of Makin at the end of March.

Four heavy and 150 light bombs were dropped and 1,800 rounds of small arm ammunition fired at various targets which resulted in the complete evacuation of Makin, and caused heavy damage and loss to the tribesmen who dispersed in various directions.

## AUSTRALIA.

### Rank Titles in the A.F.C.

On and from March 31st, 1921, the rank titles of officers of the Australian Flying Corps from Lieut.-Colonel downwards were altered so as to conform with those now being used in the R.A.F.

## FRANCE.

### Military Attaches Abroad.

The French Air Ministry have just appointed Air Attachés to their Embassies in the following cities :—Bucharest, Rome, Tokio, Washington, Pekin and Madrid.—E N

## UNITED STATES OF AMERICA.

### Washington—Santo Domingo.

Two D.H.4Bs flown by Major T. C. Turner, Chief of the U.S. Marine Corps Aviation, and Lieut. Lawson H. Sander-

# NAPIER

450 h.p. AERO ENGINE

**"The Napier is an engine which I like to sit behind. I have never heard a pilot say anything but good of the Napier. She inspires confidence. The Napier carries through her job without fuss or trouble, with an ease that justifies her name, and places her in the front rank of high-powered engines for war or civil aircraft."**

*Extract from letter from well-known test pilot. Original can be seen on application.*

*Napiers were the only engines used in the Aircraft which secured the highest prize in each of the three classes of the British Air Ministry Competitions.*

**D. NAPIER & SON, Ltd.,**
14, New Burlington Street, W.1.
Works, Acton, London,
W.3.

son, U.S.M.C., carrying Lieut. B. G. Bradley and Gunnery Serjt. C. W. Rucker, flew from Washington to Santo Domingo, Hayti and back, arriving at Bolling Field on the return journey on April 22nd. It was intended to fly to St. Thomas, a small U.S. possession in the Virgin Islands, but owing to quarantine at Puerto Rico, due to the presence of bubonic plague, the machines did not go beyond Santo Domingo City.

The total distance covered was 4.842 miles, while the total elapsed time was 24 days. The total flying time for the double journey was 46 hours 17 minutes.

All overhauling and inspection was carried out *en route*, but the D.H.4s. and the Liberty engines gave no trouble.

The worst features of the trip were encounters along the Atlantic Coast between Key West and Fayetteville, where landing fields are few and far between. Crossing Windward Passage between Cuba and Hayti very heavy winds were met with.

At Camaguey, Cuba, a landing was made on the main Plaza, there being no landing fields near the city. In spite of the rows of telegraph poles, wires, etc., a safe landing was made.

## P.C. R.33.

Civil Airship G-FAAG, usually called the R.33, did some excellent work on point duty directing traffic on Derby Day. In spite of the somewhat primitive and slow ground communications the ship was responsible for spotting and remedying several blocks in the traffic, and those who used the roads spoke very highly of the improvement of the traffic control as compared with previous years.

On subsequent occasions portable wireless sets must be erected at all important road junctions so that blocks in the traffic can be checked instantly.

**Independent Force**

## ROYAL AIR FORCE.

THE

THIRD ANNUAL REUNION DINNER

of the

INDEPENDENT FORCE,

Including all Officers of

Army Troops

and all other attached Units, will be held at the

HOTEL CECIL

on

Monday, June 20th, 1921,

at

7.30 p.m. for 8 p.m.

In the Chair:

Air Marshal Sir H. M. Trenchard, Bart.,

K.C.B., D.S O., A.D.C.

H.R.H. THE DUKE OF YORK, K.G.,

has graciously signified his intention of being present.

You are requested to bring this notice to the attention of any eligible officers who may not have received a circular.

TICKETS, Price 17/6 (excluding wines), may be obtained from:—Major T. V. Smith, M.C., or Sq., Ldr. S. M. Cleverly.

Apply to the Secretaries,
care of Room 337 E,
Alexandra House,
Kingsway, W.C.2.

*Evening Dress with Miniatures.*

The following officers have also promised to be present:—Major-General J. E. Dickie, C.B., C.M.G., Group-Captain C. L. N. Newall, C.M.G., C.B.E., A.M., Wing-Commander L. Greig, M.V.O., Wing-Commander J. H. A. Landon, D.S.O., C.B.E., Lieut.-Col. J. Waley-Cohen, C.M.G., D.S.O.

## 55 SQUADRON DINNER.

The Annual Dinner for Officers of 55 Squadron R.A.F. will take place at the Holborn Restaurant at 19 30 hours on July 2nd, the night of the Aerial Pageant. All past and present Officers of the Squadron who have not already applied for tickets are invited to do so to Squadron-Leader J. E. A. Baldwin, D.S O., O.B.E., "T" Depot, R.A.F. Uxbridge.

## VENDOME REUNION DINNER.

Arrangements are being made to hold a reunion dinner of all Officers who served at Vendome Air Station. This will take place at the Criterion Restaurant on Friday, June 17th, 1921, at 6.45 p.m. Those wishing to attend should notify

**HAROLD FOORD, Sandy Knoll, Ewell, Surrey**

('Phones—Victoria 4210. Epsom 319),

as soon as possible, in order that the necessary arrangements can be made.

## THE LAUNCH OF THE FIRST LIFE SAVING RAFT.

On June 2nd there occurred an important event in the history and development of aeronautics. The first life-saving raft, the "Austin Lifefloat," designed and patented by Mr. W. J. Austin, of 3, Woodlands Terrace, and Metropolitan Bank Buildings, Swansea, was launched from an aeroplane belonging to the Welsh Aviation Co. Ltd., of Swansea, piloted by Lieut. Surrock.

The raft was fastened to the fuselage of an "Avro" aeroplane and was dropped from over 100 feet into Swansea Bay. Members of the Swansea Swimming Club dived from on a boat and swam to the raft. Five persons, including a lady, pulled themselves onto the platform inside the raft and four others held onto the lifelines around the outside of the raft and all were paddled ashore by the inside occupants by means of the two paddles provided with the raft.

This test proved: (a) That the raft is a sound practical proposition; (b) that folding into such a small space it does not interfere in any way with the flying of the aeroplane; (c) that it comes quickly into operation; (d) that the floating capacity is immense, as with all the load on the raft there was not more than 3 inches draught out of 16 inches diameter of tubular airbag; (e) that persons can tumble into it easily from outside; (f) that they can paddle themselves to any given point.

Before launching the float a previous test was taken on the airbags. The compressed air in the cylinders was released into the air bags and allowed to stand for 40 hours, at the end of which time the bags were still fully blown up. This proves there is really no reasonable limit to the life of the raft during use.

It may be explained the raft is automatic, collapsible and reversible, that is to say it is immaterial which way it falls it is always "right side up." The whole operation of the raft from closed to open position takes only 30 seconds.

Obviously this is precisely the kind of life-saving apparatus which ought to be carried on all cross-Channel machines and is not.

## THE REORGANISATION OF MARTINSYDES.

All who are interested in aircraft will be glad to hear that the reorganisation of Martinsyde Ltd. is proceeding in a highly satisfactory way. As one of the pioneer firms of the Aircraft Industry the name is of very high value, and the high reputation for good work which the name Martinsyde holds in the Aircraft Industry has been already earned by the Martinsyde motor cycles. Despite the general slump in trade, Martinsyde motor cycles are selling extraordinarily well and are performing all over the country in a manner worthy of the Martinsyde name.

As regards the aircraft side of the business, although it is literally true that at the moment the firm is not building any new machines this is largely due to the fact that the Aircraft Department is being reorganised pending the production of new designs, which are now in hand. Mr. H. P. Martin, one of the founders of the firm, is technical director, with Mr. Doyle, whose success as an airscrew designer with Lang Propeller Ltd. is well known to the Trade, as chief designer. Mr. G. Tilghman Richards, also a pioneer of the Aircraft Industry, is general manager in charge of the works, and so is responsible for both motor cycle and aircraft production.

The future policy of the firm is to take a prominent part in competition work and so attempts on various aeroplane records by new Martinsyde aeroplanes may be expected before very long.

The success of the reorganisation scheme is the more hopeful seeing that the financial side is in the able hands of Mr. J. Taylor Peddie, who has in his time made successes of far less promising propositions than Martinsyde Ltd. Mr. Peddie is now chairman of directors, and is taking a very lively personal interest in the proceedings.

## A NEW SUPERMARINE.

A new amphibian, designed and built as a Fleet Spotter, to the order of the Air Ministry, has just completed acceptance tests at the Supermarine Works.

This machine, which has gained much from the experiences of the constructing firm during the Air Ministry Competition last year, is fitted with a new and improved type of landing gear, which has given extremely satisfactory results on test.

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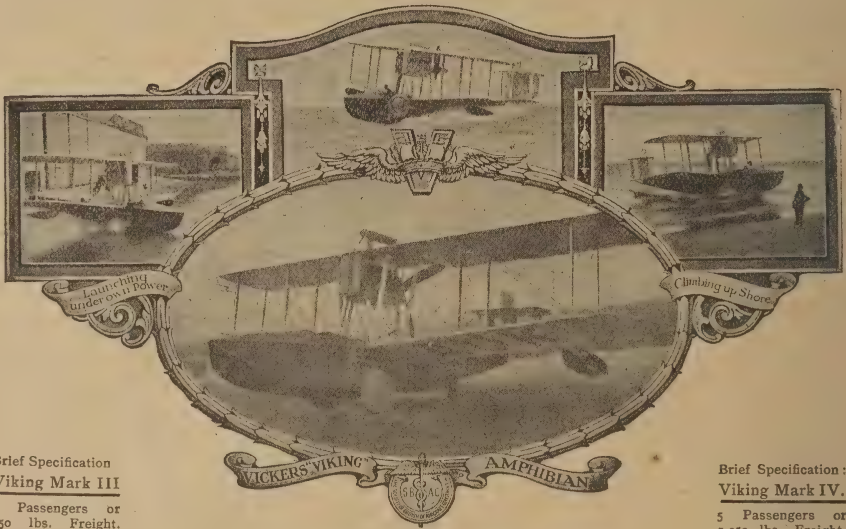

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5 Passengers or 750 lbs. Freight.

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HEIGHT ; 15′ 1″
LENGTH ; 33′ 5″

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July, 1920

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3. **Climb to 1,000 metres.**
4. **Altitude with full load.**

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## THE WEEKLY COMMENTARY.

The fourth of the articles on "Variable and Other Wings" which appears below deals with the possible combination of Handley Page slots and camber changing flaps, and with a very ingenious flexible wing of considerable novelty.

In conclusion a summary of the advantages which can be attained by the use of variable wings points out that quite apart from the effect on wings alone, such devices may make possible very great improvement in the overall efficiency of the machines on which they are used.

It should again be emphasised that this series of articles has dealt with this subject in the most elementary manner possible, and that for reasons of clarity and simplicity certain aspects of the subject which will at once appeal to the aeroplane designer have necessarily been neglected.

A number of books of technical interest are briefly reviewed on page 532.

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Some account of a visit to the Royal Airship Construction Depôt at Cardington will be found in this issue. (Page 530.)

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A very complete record of all the wind tunnel tests on wing sections of importance—except such as have been made in Germany—has just been published by the American Advisory Committee for Aeronautics. Those interested in this subject will find details of this publication on page 533.

* * *

## ON VARIABLE AND OTHER WINGS.—III.

### Combined Slots and Flaps.

There are very considerable possibilities in the use of simple slots combined with a modified form of camber changing flaps. If instead of arranging the hinged nose and trailing edge flaps of the type used on the Wright monoplane and the Sanders' "Kittiwake" (see previous article) to give in their maximum camber position a continuous wing section, they can be arranged to open slots of the form used in the Handley Page wing, the maximum lift which will be obtained should be very greatly increased. Such an effect can be attained by the use of a wing section such as that shown in Fig. 7.

The nose portion is hinged at A, the trailing portion at B, on brackets projecting from the spars. These brackets would probably be of the nature of extended ribs. Any type of control gear which can be used for ordinary flaps will serve to operate these, and arrangements similar to those previously described could be used to make use of the flaps for lateral control. Pulling down the flaps then converts the wing into a heavily cambered section, and at the same time converts the heavily cambered wing into a Handley Page double slotted aerofoil.

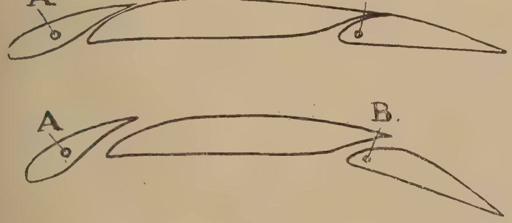

Fig. 7.

Also it can be seen that by putting pivot B far forward the nose of the aerofoil moves down but slightly compared to the similar movement of the trailing edge, and therefore pulling down the flaps increases the incidence of the wing, and reduces the difficulties which would otherwise be introduced by the very coarse stalling angle of the slotted wing.

### The Possibilities of Such Combined Wings.

By such methods, on the basis of Mr. Handley Page's test figures, one should be able to increase the maximum lift obtainable by the use of the flaps by about 60 per cent. Assuming that one fitted such a gear to the Glenn Martin wing referred to in the second article of this series, one should be able to increase the loading for 45 m.p.h. minimum speed to nearly 16 lb. per sq. ft., and with the slots closed and flaps up retain a wing with very good high speed qualities.

Under these conditions it should be possible to obtain the best value of L/D, that is the minimum of thrust, at a speed equal to twice the landing speed, instead of at about 1½ times landing speed, as in the case of a fixed wing of the usual high speed type.

That is to say, that if one is allowed a fixed total weight per h.p. then for any given landing speed the top speed given by the slotted and flapped wing should be appreciably higher than that possible with the best fixed wing. If alternatively a definite top speed is aimed at, one can reach that top speed and obtain a landing speed 30 per cent. to 40 per cent. below that possible with the fixed high speed wing.

If the landing speed is the same in both cases the area of flapped and slotted wings will be half that of the fixed wing and about two thirds of that of the flapped but unslotted wing. There seems no reason to suppose that the operating and controlling mechanism, or the added structure weight of the flapped wing, need be very seriously increased by the adaptations necessary to provide the slots, and the saving in weight of wing structure due to the reduced surface needed should be sufficient to allow a considerable increase in the proportion of useful load to total weight which can be carried.

### A Flexible Wing.

Since the appearance of this series of articles a reader has drawn attention to a type of variable camber wing which is illustrated in Figs. 8, 9, and 10.

These sketches (from the patent) represent a form of variable camber wing due to Mr. W. J. Mead, of Addlestone, Surrey, described in the specification of Patent No. 158099, granted to him. The wing is built up in the usual way upon front and rear spars, and the nose portion of each rib is indeformable as is usual. Instead of the usual rigid drift struts between the two spars, pin jointed struts (A and B, 2 Fig. 8) are used, thus allowing the rear spar to move up and down relatively to the front spar. At intervals along the span a member (E, 3 Fig. 8) takes the place of one of these pin jointed struts, and

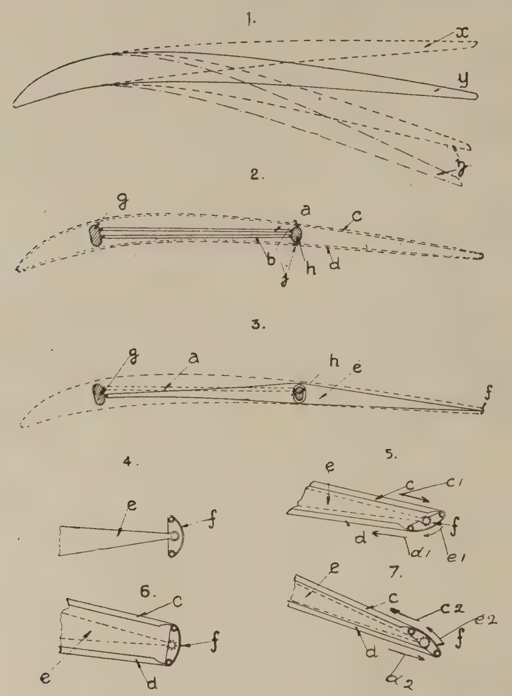

Fig. 8.

instead of being attached to the rear spar it passes round that spar—giving sufficient clearance to allow of a slight rock in the spar as it is moved up or down—and thence is extended to carry the trailing edge. This edge itself is supported from these extension struts on a rocking lever (F, 4, 5, 6, and 7 Fig. 8). The ribs are composed of flexible top and bottom members, and are attached by hinges at top and bottom of the rear spar, and at the trailing edges are hinged to the rocking edge.

Movement of the rear spar then bends the whole wing, making it possible to achieve a wide range of camber, at the same time maintaining a fair outline to the wing. The provision of the rocking trailing edge secures that the girth of the wing section remains constant, and the fabric therefore will not change in tautness with change of wing section

In Fig. 9 is shown diagrammatically a method of controlling the camber at the lower wing root, the rear spar moving up and down in accordance with the rotation of the square-threaded screw, which is operated by a chain and sprocket.

In Fig. 10 a suggested method for control at an interplane strut is shown. The rod A takes the place of incidence bracing, and is lengthened and shortened by a screw mechanism similar to that at the wing root, and controlled by an extension of the same controlling chains.

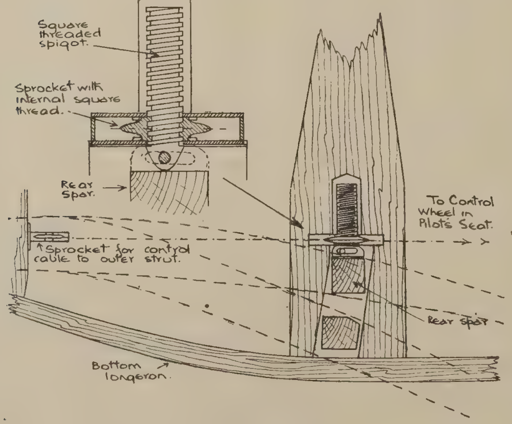
Square threaded spigot.
Sprocket with internal square thread.
Rear Spar.
To Control Wheel in Pilots Seat.
Sprocket for control cable to outer strut.
Rear spar
Bottom longeron.

Fig. 9.

It seems fairly obvious that the fair curve which is maintained over the whole wing surface, and the absence of any breaks, should give this system of camber changing the advantage of good streamlines. The mechanical design of an operating gear does not appear to offer any serious difficulties, nor need the weight thereof be prohibitive.

But very careful design will be necessary to secure the necessary flexibility of the ribs for camber changing without allowing undesirable deformation under load. Also considerable trouble may result if the pin joints on the drift struts develop slack and allow the rear spar to rock slightly.

Nevertheless the difficulties of construction do not appear to be insuperable and the scheme is worth a trial.

The effects of such a camber changing device should be comparable with those produced by the nose and trailing edge flap combinations already discussed.

### THE TOTAL VALUE OF CAMBER CHANGING DEVICES.

Up to the present it has been assumed, for the sake of simplicity of treatment, that one could assess the value of a particular wing in terms of the qualities of the wings and their weight, on the assumption that no other change would be made in the machine as a whole.

This is an entirely inadequate treatment of the subject. It serves as a rough guide to the comparative value of the various types of variable wings, but it does not adequately represent the value of such wings as compared with the ordinary type of fixed wing To make this matter clear a specific example may be taken, and the results which are arrived at by this limited view of the subject will be compared with those to which a more complete consideration of the whole of the effects of the possibilities increased loading would lead.

For this purpose it will be well to take an extreme case and assume that the results which seem to be possible from the combination of variable camber wing to which the highest claims are made, with a pair of Handley Page slots, can be realised in practice. This is by no means to be taken as an expression of belief that these results would be reached—it is merely an illustration of the results which would accrue from the use of high loading, on a hoped for wing.

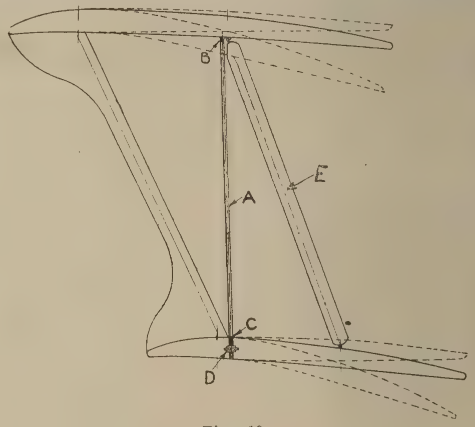

Fig. 10.

Taking as an example the modern type of high speed passenger carrier, an examination of its characteristics shows that the most effective type now existing carries 11 lb. per sq. ft. of wing surface, lands at 65 to 70 m.p.h., carries 15 lb. per h.p. total weight and about 2.5 lb. per h.p. of useful load. Under these conditions the maximum speed is 120 m.p.h.—which coincides with an angle of incidence of the wing somewhat less than that of best L/D. The actual value of L/D at this angle is not, however, very far from the best value, and little is therefore to be gained in speed by increasing the loading. If one substitute for this wing one having the characteristics of the Martin wing referred to above, but fitted with H.P. slots, one may reduce the wing area by 33 per cent., giving a loading of 16 lb. per sq. ft. and a landing speed of about 45 m.p.h. With the slots closed and the wing flattened out, the present top speed of 120 m.p.h. would be reached at an angle very close to the best L/D incidence, and the actual value of L/D would be practically the same as in the unaltered machine.

Therefore at the same top speed the thrust and the h.p. needed to propel the wings would be practically the same. But with only two-thirds the wing area it should be possible to reduce the resistance of wing struts and wiring, thus reducing the h.p. needed at that speed, and at the same time one should be able to save an appreciable amount of weight in the wings, thus adding to the useful load carried.

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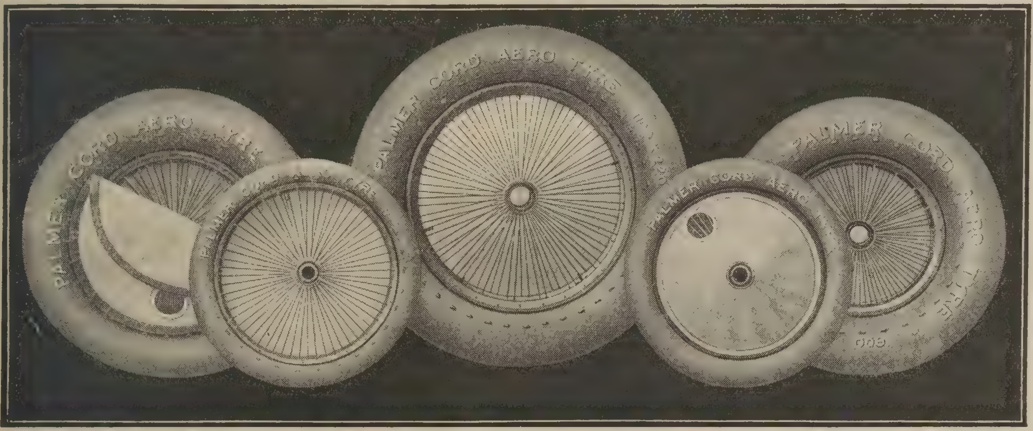
# LANDING WHEELS & TYRES



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| ,, | 17 | 72.39 | 12.7 | Central |
| 450×60 | 30 | 89. | 31.75 | Central |
| ,, | 138 | 130. | 38.09 | Central |
| 575×60 | 21 | 160. | 28. | Central |
| ,, | 34 | 150. | 31.75 | 104/46 |
| ,, | 111 | 150. | 38.09 | 104/46 |
| 600×75 | 21 | 160. | 28. | Central |
| ,, | 34 | 150. | 31.75 | 104/46 |
| ,, | 111 | 150. | 38.09 | 104/46 |
| 700×75 | 78 | 178. | 44.45 | 132 46 |
| ,, | 79 | 178. | 44.45 | Central |
| ,, | 100 | 178. | 38.09 | 132 46 |
| ,, | 101 | 178. | 31.75 | 132/46 |
| 700×100 | 77 | 178. | 44.45 | 132/46 |
| ,, | 92 | 185. | 55. | 135/50 |
| ,, | 95 | 185. | 55. | Central |
| ,, | 96 | 178. | 55. | 132/46 |
| 700×100 | 99 | 178. | 38.89 | 132/46 |
| ,, | 112 | 150. | 38.09 | Central |
| 650×125 | 119 | 178. | 55. | 132'46 |
| 750×125 | 77 | 178. | 44.45 | 132/46 |
| ,, | 92 | 185. | 55. | 135/50 |
| ,, | 95 | 185. | 55. | Central |
| ,, | 96 | 178. | 55. | 132/46 |
| ,, | 99 | 178. | 38.89 | 132 46 |
| ,, | 112 | 150. | 38.09 | Central |
| 800×150 | 82 | 185. | 55. | 135/50 |
| ,, | 85 | 185. | 55. | Central |
| ,, | *36 | 185. | 55. | 135/50 |
| ,, | *40 | 185. | 60.32 | 135/50 |
| ,, | 152 | 185. | 66.67 | 135/50 |
| 1000×150 | 131 | 220. | 66.67 | Central |
| ,, | 102 | 185. | 55. | 125/60 |
| ,, | 141 | 250. | 80. | Central |
| ,, | 201 | 185. | 60.32 | 125/60 |
| 1000×150 | 209 | 185. | 55. | Central |
| ,, | 210 | 185. | 60.32 | Central |
| 1000×180 | 148 | 220. | 80. | Central |
| ,, | 149 | 185. | 55. | Central |
| ,, | 155 | 220. | 66.67 | Central |
| 900×200 | 107 | 185. | 55. | Central |
| ,, | 108 | 185. | 55. | 125/60 |
| ,, | 128 | 220. | 66.67 | Central |
| ,, | 137 | 250. | 80. | Central |
| ,, | 202 | 185. | 60.32 | Central |
| 1100×220 | 134 | 220. | 66.67 | Central |
| ,, | 136 | 250. | 80. | Central |
| 1250×250 | 133 | 250. | 80. | Central |
| ,, | 154 | 304.8 | 101.6 | Central |
| 1500×300 | 115 | 304.8 | 101.6 | Central |
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Considering this effect alone, an appreciable result can be attained. The wing area is roughly 1.6 sq. ft. per h.p., and the weight of the whole wing structure in a machine of this size and type will be about $1\frac{1}{4}$ lb. per sq. ft. That is to say, of the 15 lb. total load per h.p. about 2.0 lb. is weight of wings. Reducing the area to two-thirds of the original value should reduce the weight of wings to at most about three-quarters of the original weight, that is to $1\frac{1}{2}$ lb. per h.p., not allowing for the added weight of the wing flap control gear.

At the very outside this gear should not weigh 10 per cent. of the total wing weight, which brings the weight of wings up to 1.65 lb. per h.p. against 2.0 for the fixed wings. It will be seen that although the total weight of wing structure is reduced, the specific weight of wings in lbs. per sq. ft. has increased as two-thirds of the area weight $\frac{1.65}{2.0}$ times the original, that is the weight per sq. ft has increased from 1.25 to 1.65 lb. per sq. ft.

Also, for the same weight per h.p. there is no very great change in top speed, but an important drop in landing speed But—and this is the most important factor—for the same total weight per h.p., the saving in wing weight can be added to the useful load. That is there is 0.35 lb. per h.p. available to add to the 2.5 lb. of useful load per h.p. previously carried. An increase of 14 per cent. in useful load per h.p., even if no gain in top speed is secured, is well worth having, particularly if it is combined with a very much reduced landing speed.

### THE INDIRECT SAVING DUE TO HEAVY LOADING.

Actually the saving in weight in a case of this sort extends beyond the direct saving due to smaller wings, because if one reduce the wing area by reducing span and chord proportionately, i.e.,, use the same aspect ratio, one can reduce the length and size of tail and thus reduce the weight of the whole aeroplane structure.

In this particular case, reducing the surface to two-thirds of the original value would mean reducing both span and chord in the ratio $1 \cdot \sqrt{\frac{2}{3}}$ or by about 4/5.

There is no very great difference in the maximum travel of the centre of pressure, expressed in fractions of the chord, as between a normal high speed wing and a high lift or slotted wing. As the chord is reduced, the actual distance of C.P. travel will be lessened, and as the weight is assumed to be kept constant, the moment which has to be supplied by the tail-plane to compensate for shifts of C.P. is also reduced, very nearly in proportion to the reduction in chord.

That is to say, the small-winged machine can do either with about 4/5 the tail area, at the same length, or the same tail on a fuselage 4/5 the length, or any intermediate size tail-plane with an appropriately reduced length of fuselage. Also as the moment acting on the tail is reduced, so are the forces acting on the fuselage. The reduced span also reduces the size of fin and rudder needed for control and stabilisation and the moments they set up in nearly the same proportions.

This applies only to that part of the fuselage between tail and the wings, and only to such parts as are not greatly affected by the direct loads—such as passengers—carried by them. But all that part of the fuselage which serves only as a tail support and the tail itself can be reduced in weight to something like half of the weight needed in the original design.

It is difficult to give an estimate of the extent of such a saving except for a specific case with all the details of design and the weights of the various parts.

In the case of such a machine as is now under consideration, designed for commercial purposes, a large part of the fuselage structure is determined not by loads due to the tail and wings, but by the actual local distribution of the goods carried. That is, a passenger must sit on a seat, and both that seat and the part of the frame which carries the seat must be strong enough to bear his weight. Also, the cross-section of the body is determined by the amount of room needed to carry the cargo, and the covering has to be strong enough to prevent the cargo or passengers falling through it.

Part of the fuselage therefore may have to be much stronger than is necessary from a consideration of the loads on the tail alone, and therefore in such a case a relatively small saving may result from the reduced tail needed with heavily loaded wings.

But in the worst case, in a machine of the species now being considered from $\frac{1}{3}$ to $\frac{1}{2}$ lb. per h.p. at least should be saved in fuselage and tail weight.

### AN ESTIMATE OF THE SAVING POSSIBLE.

Taking this saving as equal to the saving already directly resulting from the reduced wing area, there is a total increase in the useful load capacity of 0.7 lb per h.p —an increase of 28 per cent. in the paying load carried by the machine, using the same engine, gaining a very considerable reduction in landing speed, and maintaining the same high speed.

As a matter of fact, the high speed will probably increase because not only is the resistance of struts and wires reduced with decreased wing surface, but the resistance of tail surfaces is also decreased. Also it is probable that, although the rate of climb and the ceiling will be somewhat reduced, the air speed corresponding to maximum climb when the wings are used in their high lift condition will be very much reduced, and the climb will therefore be at a steep gradient—which is what is needed to climb out of small fields.

Thus it will be seen that, even in cases where the variable type of wing does not promise any very great improvement in performance, when it is assumed that the weight per h.p. is to remain constant, it does mean that of that weight per h.p. a considerably increased proportion can be made available for useful load. Alternatively, for the same total useful load, it means that one may use a very considerably smaller h.p. and a still smaller machine.

For instance, if one desired to redesign the machine above discussed, not for the same engine but for the same total useful load, using the same type of wing as above considered, one would be able to reduce the h.p. used in the ratio 100/128, or to a little less than 4/5 of that used in the original. The loaded weight of the machine would then be 4/5 of that of the original. The wing surface would be $4/5 \times 2/3$, or nearly half of the original. As a matter of fact the saving in this case would be even more than this, for as the area decreases for similar machines the weight per square foot of similar wings decreases, but the change is small in machines within the normal range of sizes, and these figures represent approximately what would be expected to occur.

### GENERAL CONCLUSIONS.

This example has been taken on the assumption that a hitherto unproved type of variable wing will produce certain results. That is, it is an entirely suppositious case. It has been shown that very important economies can be attained in reality, even in cases where at first sight and from a consideration of the direct effect of wing qualities no very great improvement in performance seems to be indicated.

The considerations which lead to this result are only too often neglected. For many years the N.P.L. and the band of theorists which operated in conjunction therewith were in the habit of judging wings solely on the maximum L/D figure, on the ground that that figure mainly indicated the possible speed attainable at a given total weight per h.p. There is some reason to believe that others who should know better have fallen into the same error, for the comparison of machines on the basis of total weight per h.p. is very usual even in design circles.

But the figure which really matters—even for war purposes—is useful weight per h.p., and this fact has often been overlooked. Therefore, in addition to the causes which have already been considered to account in some wise for the prejudice—sometimes shown in regard to variable wings—one finds a false argument such as the following :—

The machine weighs so many pounds per h.p. and her top speed is only so many m.p.h., and her speed range is so much. You can get just as good a performance with a fixed wing at the same weight per h.p., so why add the complication of flaps? The truth is generally that with the same engine, the same total weight, and the same performance the variable camber machine has been carrying an additional useful load.

For instance, the performance of two seaplanes of approximately the same total weight and with the same engine are compared and it is found that there is little difference. But if one is fitted with variable wings and carries a pair of 200 lb. bombs which are absent from the useful load of the fixed wing machine, the variable wing is surely justified.

Beyond these matters the very fact that the heavily loaded machine is smaller, requires less housing space, is generally more robust and less liable to damage from clumsy handling, represent very real advantages.

### A SUMMING UP.

Summing up, therefore, it may be said that any type of variable camber gear which allows of the development of a high maximum lift with a high value of L/D at normal flying speeds, including the Fairey type flaps, combined nose and trailing edge flaps, flexible wings such as that due to Mr. Mead described above, and the Handley Page wing, either alone or combined with flaps, offer opportunities of greatly increasing the efficiency of the aeroplane as a mode of transport.

The measure of the improvement which can be attained depends in a very complex manner on a large number of factors. Generally the higher the maximum lift one can develop by any such expedient, the greater the possible saving in weight of the complete aeroplane. Against this saving one has to offset the weight directly due to the mechan-

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ism employed in the variable wing gear. But the mere development of a high maximum lift, and the consequent saving in weight, will not offset a very high wing resistance at high speeds.

Therefore it is obvious that the question of whether a particular type of variable wing will give better results than another can only be settled after a review of the whole conditions of the particular case, and after a certain amount of practical experience with the particular wings in question.

Up to the present, as has already been remarked, only the Fairey type of flap wing has been thoroughly tested in practice. Such performance tests on machines fitted with this type of wing as are available to the public relate to machines designed some time ago and do not embody the improvements introduced by Mr. Fairey into more recent designs. But they do show that with the possible exception of such extreme cases as pure racing machines, and possibly very low speed cargo carriers, one can attain with the same total weight per h.p. at least a performance equal to that of any fixed wing machine, with a larger proportion of that total weight available as useful load capacity, and that this result can be achieved on a more compact and robust machine.

It remains to be seen whether the more recent types of variable wing which have been discussed will fulfil in practice the hopes of their designers and will permit of still further improvements in the same direction as that already traversed by Mr. Fairey. He has at least the very important advantage over the later comers into the same field of endeavour of a long experience in utilising wings of this type to the best advantage.—W. H. S.

## A PRINTER'S ERROR.

An unfortunate printer's error occurred in the article on Wing Flaps and Operating Gears on page 506 of the last issue of THE AEROPLANE. Owing to the misplacement of two lines the following nonsensical statement appeared :—

"Mr. Fairey's claims are justified by the results attained but does not believe that it has yet shown any result comparable with those attained by flaps."

This should read :—"As to the slotted wing Mr. Fairey preserves an open mind but does not believe that it has yet shown any result comparable with those attained by flaps."

The following paragraph should then have begun by the statement that "Mr. Fairey's claims are justified by the results obtained," followed by the further statement that "the author of the article on variable wings was at the time at which Mr. Fairey began his tests on flaps working upon the same problem of obtaining high maximum lift."

From this it will be seen that Captain Sayers and Mr. Fairey are of the same opinion as regards the value of flaps as the means of increasing the lift of wings. In fact, as might be gathered from the concluding sentence of the last-mentioned paragraph, if Captain Sayers had taken out a patent for his own operating gear for flaps, he quite conceivably might have had Mr. Fairey on his track in these days for infringement of the Fairey patents, which apparently stand to-day unchallenged.—C. G. G.

## A VISIT TO CARDINGTON.

On Thursday, June 2nd, the Superintendent (Mr C. I. R. Campbell) and staff of the Royal Airship Construction Department, Cardington, Bedfordshire, were "At Home" to a number of favoured visitors, who were shown over the works, given an opportunity of seeing considerably more of the real inwardness of a modern airship than is usually discernable, and entertained in the most delightful surroundings and in the most hospitable manner possible.

The Cardington works are of a most deceptive appearance. Situated in the open country, with ample open space around them, even the big double airship shed looks to be merely a fair sized building. The machine, engine, fabric and other workshops which are around it look quite small, and it is not until the visitor—deprived of matches, cigarettes, pipes, and all other articles capable of being used for incendiary purposes—enters the shed, that he, or she, realises the colossal scale upon which an airship factory must be conceived.

Presumably for those who are accustomed to living with, or on, an airship, Cardington presents other features of interest, but it is very certain that for those who cannot claim this intimacy a visit to such an establishment leaves little other impression than that of the colossal dimensions and the colossal complexity of a modern rigid airship.

At the present moment Cardington shed contains R.38—otherwise X.R.2—which is on the point of completion for delivery to the United States Navy—and the skeleton of R.37, for the moment derelict. R.37 is to outward seeming complete as to framework, and gives a thoroughly good idea of the nature of that framework.

R.38 is partly inflated, has her outer cover in place, except below the central gangway, has the forward control car in position, and the power eggs in course of attachment. The whole length of the corridor was open to view, and a very excellent idea of the innumerable fittings and gadgets which go to form part of a large airship's equipment was thus available. The present writer has no intimate knowledge of airships and he cannot hope to describe these details. A week or two's stay at Cardington might enable him to do so, but at the moment he is still in a state of somewhat confused amazement, and ready to regard anyone who can properly claim a working knowledge of airships as something of a superman.

A rigid airship cruising at a couple of thousand feet overhead is an imposing sight, but a really close-up view, such as that given at Cardington is a revelation, both as to the enormous dimensions and as to the complexity of the structure and equipment of such craft, and all those who have an opportunity of seeing a modern rigid at really close quatrers are strongly urged to take that opportunity.

No one who was present at Cardington on this occasion will be able to regard complacently the probability that the establishment will shortly be closed, its staff dispersed, and the accumulated knowledge and experience of airship design and construction represented should be lost to this nation.

One feels that every visitor to Cardington on this occasion will share this view. This feeling will be particularly strong in the case of those of the visitors who are not very intimately acquainted with airships, for the visit cannot fail to have given to them a very vivid impression of the enormous amount of time, of money, and more than anything else, of hard work and patient perseverance which has been expended on the development of this industry in England.

This impression will have been accentuated by the courteous and hospitable reception given even to the most ignorant and unimportant of the visitors by Mr. Campbell and every member of his Staff.

The majority of the visitors reached Cardington by the humdrum methods of road or rail. Air Commodore E. M. Mait-

THE BRISTOL "BADGER."—A high performance two-seater fighter, built by the Bristol Aeroplane Co. Ltd. and engined with a Bristol "Jupiter" air-cooled engine of 450 h.p.

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SHEFFIELD.

SHEFFIELD

land, C.M.G., D.S.O., A.F.C., arrived in a manner perhaps equally commonplace in so far as he is personally concerned, but scarcely yet to be passed unremarked. Being at Howden on the day previous, he took part in the earlier stages of a night flight made by H.M.A. R.80, and arranged that he should be dropped at Cardington when the ship passed that way. Accordingly at 3 a.m. he, the boy Dobbs, and their luggage, stepped overboard attached to three separate parachutes, and alighted safely within a few hundred yards of their objective.—W. H. S.

## BOOK REVIEWS.

### Aeroplane Performance Calculations.

Though many books have been written upon the theory and practice of aeroplane design, and upon the resistance, the stability and the factors which influence performance, there has so far appeared no work which gives in the practical form needed by the would-be designer a guide to the methods which should be employed in estimating the performance of an aeroplane from the data afforded by the drawings thereof.

Mr. Harris Booth has essayed to fill this gap in the work now considered. The book forms one of the series of Directly Useful Technical Series, and in accordance with the aims of this series, the general theory is combined with the practical application thereof, that the student may learn not only how to calculate performances, but why he should perform the particular calculations in the manner set forth.

For this reason the work is divided into three sections (I) Descriptive and Theoretical; (II) Practical Procedure; and (III) Illustrative Examples.

Mr. Booth has a very long practical experience of performance calculation, and his work therefore very naturally is of some considerable value. In particular the practical hints as to the methods to be adopted to set about the computation of body resistance and the like are likely to be useful and instructive to the young designer and to a less extent to some older ones.

But Mr. Booth unfortunately does not shine as an expositor, and his habit of juggling with equations entirely without any exposition of the physical realities behind the expressions involved—aggravated by the continual interposition of that highly suspicious phrase "of course"—makes him both tiring and difficult to follow.

It is not uncharacteristic of the author that he should have set forth four different schemes for the production of performance curves, differing only in the number of minor factors affecting performance which are taken into account, and should have demonstrated by how little the results differ. But he has entirely failed to point out that the difference between these four methods is practically negligible compared with the probable errors involved in many of the assumptions upon which the whole work is based, and that therefore the simplest method is as likely to be accurate as is the most complex.

As a matter of fact experience shows that with the aid of a little judgment methods very much more simple than those here employed suffice to give results which represent as closely as any of those here set out the actual performance as measured in flight.

Nevertheless it is doubtless wise to conceal these methods from the inexperienced, and to allow them to discover for themselves what factors may and what may not be neglected with safety.

("Aeroplane Performance Calculations." By Harris Booth, B.A., A.M.I.C.E., F.R.Ae.S. The Directly Useful Technical Series. London: Chapman and Hall, Ltd. Price, 21s. net.)

### The Elements of Meteorology.

It is more than ever of great importance that those who are concerned in the operation of aircraft should have a fair working knowledge of meteorology, and the importance of this science is not likely to decrease in the near future, so a clear understanding of the basis of the science should be of great value to all concerned with aviation.

"Simple Lessons on the Weather" has been written largely as a text book for school children, and so is in language of a simplicity to be understood by aviators. Nevertheless, simplicity has not been allowed to displace accuracy, and all those who are anxious to obtain a clear understanding of the elements of meteorology should find this book a useful guide.

("Simple Lessons on the Weather." By E. Stenhouse, B.Sc. London, Methuen and Co., Ltd. Price 4s. net.)

## THE PROPERTIES OF AEROFOILS.

The American National Advisory Committee for Aeronautics has just issued, as Report No. 93, a collection of the results of the tests made on aerofoil sections by the leading aerodynamic laboratories in America, Britain, France and Italy.

The object of this report is to bring together the investigations of the various aerodynamic laboratories of this country and Europe upon the subject of aerofoils suitable for use as lifting or control surfaces on aircraft. The data have been so arranged as to be of most use to designing engineers, and for purposes of general reference. It is the purpose of the Committee to publish all existing tests on aerofoil sections.

The absolute system of coefficients has been used, since it is thought by the National Advisory Committee for Aeronautics that this system is the one most suited for international use, and yet is one for which a desired transformation can be easily made. For this purpose a set of transformation constants is included in the report.

Each aerofoil section is given a reference number, and the test data are presented in the form of curves from which the coefficients can be read with sufficient accuracy for design purposes. The dimensions of the profile of each section are given at various stations along the chord in per cent. of the chord using as datum the line shown on the curves. The shape of the section is also shown in reasonable accuracy to enable one more clearly to visualise the section under consideration together with its characteristics. The more accurately to obtain the dimensions of the profile of each section, a separate data sheet for each section has been included, which gives an additional decimal place for the most of the ordinates.

Three separate indices are given—a chart index which makes it possible for a designer to select the wing section most suitable for a particular design he is interested in; a group index which is arranged in the same order as the curve sheets; that is, by countries and laboratories at which tests were conducted, each section also being designated by a reference number and an alphabetical index. In all the properties of 214 sections are given.

In order that the designer may easily pick out a wing section which is suited to the type of machine on which he is working, four index charts are given which classify the wings according to their aerodynamic and structural properties.

A copy of Report No. 93 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D.C.

## LIFE-SAVING AT SEA.

The following letter has been received:—

Sir,—I have followed carefully the letter published in this week's issue from Mr. Duke, the pilot of the Fokker F.III, and your reply regarding "flotation," and as my name was mentioned in the argument as a maker of life-saving rafts especially constructed for aircraft, I think it my duty to the progress of aeronautics to pass a few comments of my views and experience when designing this special life-saving raft.

In the first place no builder or designer of aircraft should think that any machine can be made unsinkable or unbreak-

**THE INSTONE AIR LINER "CITY OF NEWCASTLE."**—Designed by Mr. Koolhoven immediately after the Armistice, built during the summer of 1919 by the now dormant B.A.T. company, this machine has been in the possession of the Instone Air Line for over two years and is still doing good work. She is fitted with the Eagle "Rolls" of 360-h.p., carries five passengers plus pilot, and has a top speed in the neighbourhood of 115 m.p.h.

able, as it is not always possible for human nature entirely to overcome the natural elements, although great strides have been made in that direction. One must not forget the supposed "unsinkability" of the *Titanic* and the disastrous results to that vessel.

Such things as floating cabins and the like appealed to me during my designing period, but I came to the absolute conclusion that it was essential to carry some kind of auxiliary life-saving gear, different from the lifebelt, which leaves a person struggling in the water with head and shoulders getting full benefit of the water—some kind of arrangement whereby a person felt he had something under and around him, and if possible to have company to talk to—a very big element when in distress. Hence the completely designed life-raft I have now on the market.

The effect of the waves (especially if the sea is in any way "angry," when it has no sympathy) on a floating cabin or any other similar article which cannot be controlled speedily spells disaster, as is well known by the effect of the sea when ordinary vessels get out of control or the waves so high as to beat the decks when even steel fittings become like pieces of straw and other fixed gear is carried away, and the disastrous effects would be far more speedily carried out to any aircraft.

Mr. Duke says the passengers have only to adjust their belts and step out, but he does not say on what—obviously it is water, but that is a terrible element to deal with, especially as the "ground floor" is so low. In the event of a forced landing on water the passenger would be either wholly or half scared—it is human nature—but would naturally feel very much easier if provided with something to step out onto, as if there were no raft to step onto they would naturally stick to the last "straw" of the cabin, until the waves had had their final blow and had caught them like rats in a trap.

A life-raft outside the cabin is at the control of and within easy reach of the pilot or his mechanic. The pilot, like the skipper of a ship, would know the right moment to release and throw the raft over and would, I assume, take the position of the skipper as "last man over," meanwhile assisting and instructing the others what to do and where to go. Four persons to a raft, which is the carrying capacity, would give courage and cheer to each other. In addition, being in a "basket," they could paddle themselves in any particular direction, as paddles are provided with the rafts. Further as the raft has life lines a large number of persons could be supported outside, and if needs be could be assisted by those inside the raft and work in "shifts."

Mr. Duke seems to overlook the fact that aircraft will, it is expected, become means of transport to the four points of the compass, irrespective of whether it is over land or water, and will probably meet with storms, etc., just like an ordinary vessel, which is compelled to carry adequate proper life-saving gear, although its cabins, chairs, and other flotable gear form a class of raft.

Swansea, May 22nd. (Signed) W. J. Austin.

## NOTES FROM ABROAD.

### FRANCE.

### Prizes for Safety Devices.

Prizes given by "L'Union pour la Securitè en Aeroplane" have been awarded as follows :—

First Prize (10,000 francs).—Messrs. Gastambide and Levavasseur for their variable surface and variable camber wing.

Second Prize.—M. Le Prieur for the "Navigraphe," a navigational instrument for use on aeroplanes and airships.

A further prize has been awarded to M. Jean Ors for the Ors parachute.

### The Grand Prix of the Aero Club de France.

It is now stated that the trouble experienced by the Farman 'Goliath" which caused it to abandon the attempt to complete the course in this competition was due to the engine and not to the airscrews. It appears that the airscrew boss became loose, overheated, and charred the airscrew.

The last competition for the prize will be held on June 20th and 21st, and entries have been made by two Farmans, a Caudron, a Nieuport, a Potez, and a Spad.

### A New French Aircraft Company.

The Latecoère concern have now floated a separate company to deal with their aircraft business, which is now to be entirely separate from the original Wagon Factory. The capital of the new company is 5,000,000 francs, and the title thereof "Compagnie Generale d'Enterprises Aeronautiques."

## TRADE NOTES.

### Bristol Enterprise.

The Bristol Aeroplane Company do not propose to confine their efforts to sell aircraft and engines to English-speaking markets alone. Evidence of this fact is to be found in the very well got up brochure describing the "Jupiter" and "Lucifer" engines of their manufacture which has just been published in French.

This gives a complete description of both engines, showing very plainly the novelties of design and construction involved, specifications, and details of some of the performances attained on test flights. There are no engines of French manufacture of the same type and class as the Bristol engines, and one must hope that what is at least a praiseworthy piece of propaganda for British products will bring a due reward to those who have carried it out.

### The Aero Kodak.

On Wednesday last, by courtesy of Kodak Ltd., Kingsway, London, one had an opportunity of trying the hand Aero-Kodak. This camera can be used for either plates or films and is quite the simplest camera of any type to use, including vest pocket Kodaks, Brownies, etc., that one has ever seen. It is small and light, and therefore easy to handle in either an open or closed aeroplane.

One of the great points in its favour is that the tension spring can be wound fully up with about one-third of a turn of the handle, thus getting over that most annoying difficulty of having to take one's hand off the screw, which usually resulted in running down the spring, one's temper, and the machine in front of one.

Half-a-dozen photographs were taken from Mr. Barnard's D.H.4 of the country round Croydon Aerodrome, and after an extensive use of aero cameras in the service one can state that one has never used a simpler or more efficient camera.

G. D.

### A Trade Move.

His many friends in the Aircraft Industry will be interested to learn that Mr. G. Tilghman Richards has been appointed General Manager of Martinsyde Ltd. Mr. Richards has long been connected with the Aircraft Industry, and before that had very considerable experience of general engineering. Thus in his new capacity his engineering experience will be of very considerable use to the production of Martinsyde motor-cycles.

His aircraft experience includes much experimental work with the famous "Secret Circle Plane" at Shoreham, and with the various experiments on interesting and novel types produced by Sir William Beardmore and Sons Ltd., especially in connection with metal construction. This special experience and Mr. Richards' undoubted ingenuity should produce some interesting novelties in the way of aircraft from the aeroplane department of Martinsyde Ltd. Needless to say, everybody will wish him and the old firm every success.

## COMPANY NOTES.

### Mortgages, Charges and Satisfactions.

De Bolotoff Ltd.—Debenture dated April 19th, 1921, to secure £1,000, charged on Co.'s undertaking and property, present and future. Holder, H. G. Selfridge, Lansdowne House, W.

NOT DEAD YET.—The British Aircraft Industry still has a few kicks left in it as evidence the above batch of six Avros which have just been delivered to the Belgian Government by A. V. Roe and Co. Ltd.

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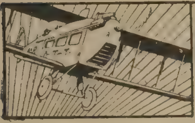

# COMMERCIAL AERONAUTICS AND CIVIL AERIAL TRANSPORT.

## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Company. B.C.—Bristol Aeroplane Company. B.M.—Brompton Motor Company.— C.A.—Dept. of Civil Aviation. F.R.—Franco-Roumanie. G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Petters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aeriens (S.N.E.T.A.).

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

**MAY 30th:**

I.L., DH18, G-EARO, London-Paris, 13.12-16.40, G.M., 5, Chattaway.
M.A., Breguet, F-CMAB, Paris-London, 09-40-20.22, Nil, 3, Delage.
H.P., HP, G-EATK, Paris-London, 11.20-14.02, Nil, 10 Rogers.
H.P., HP, G-EATM, Paris-London, 11.20-19.22, G., 9, McIntosh.
M.A., Breguet, F-CMAK, Paris-London, 12.45-20.26, G.M., Nil, Perignon.
I.L., Bat, G-EAPK, Paris-London, 14.303-19.35, Nil, 2, Powell.

**MAY 31st:**

K.L., Fokker, H-NABH, London-A'dam, 10.05-13.25, G.M., Nil, Holmes.
M.A., Breguet, F-CMAD, London-Paris, 10.12-16.00, G., 3, Paille.
M.A., Breguet, F-CMAC, London-Paris, 10.10-16.50, Nil, 2, Donelin.
H.P., HP, G-EATN, London-Paris, 14.45-18.00, Nil, 10 Wilcockson
S.N., DH9, O-BELG, London-Brussels, 12.20-14.23, G.M., 2, Catta.
H.P., HP, G-EATK, London-Paris, 14.45-17.50, Nil, 5, McIntosh.
M.A., Breguet, F-CMAB, London-Paris, 14.53-17.30, Nil, 2, Delage.
M.A., Breguet, F-CMAK, London-Paris, 16.15-19.10, G., 2, Perignon.
M.A., Breguet, F-CMAM, Paris-London, 09.45-12.22, G.M., 3, Challoux.
I.L., DH18, G-EARO, Paris-London, 11.20-13.50, Nil, 8, Chattaway.
S.N., DH9, O-BATA, Brussels-London, 12.47-17.15, G.M., 2, Sahnovsky.
M.A., Spad, F-CMAY, Paris-London, 12.50-15.15, G.M., Nil, Le Sec.
K.L., Fokker, H-NABT, A'dam-London, 14.00-17.40, G.M., 3, Hofstra.
K.L., Fokker, H-NABQ, A'dam-London, 15.25-19.10, G., 3, Olley.
M.A., Spad, F-ACMC, Paris-London, 16.20-18.35, M., 5, Charpentier.

**JUNE 1st:**

K.L., Fokker, H-NABT, London-A'dam, 10.06-14.00, G.M., Nil, Hofstra.
M.A., Breguet, F-CMAM, London-Paris, 10.15, 12.30, Nil, 2, Challoux.
I.L., Vimy, G-EASI, London-Paris, 12.30-15.00, G.M., 11, Chattaway.
S.N., DH9, O-BATA, London-Brussels, 12.46-15.23, G.M., 2, Sahnovsky.
M.A., Spad, F-ACMC, London-Paris, 16.04-18.40, Nil, 3, Charpentier.
M.A., Breguet, F-CMAI, London-Paris, 10.34-12.50, Nil, Nil, Portal.
M.A., Spad, F-CMAY, London-Paris, 16.40-18.37, Nil, 1, Le Sec.
M.A., Breguet, F-CMAC, Paris-London, 10.30-13.15, G.M., 2, Briere.
H.P., HP, G-EATN, Paris-London, 11.04-17.10, G., 10 Wilcockson.
S.N., DH9, O-BELG, Brussels-London, 11.55-14.17, G.M., 1, Van Opstal.
G.E.A., Goliath, F-FHMY, Paris-London, 13.20-16.13, G., 12, Bechler.
P.O., Bristol, G-EAWB, Paris-London, 13.23-15.45, G., 1, Butler.
K.L., Fokker, H-NABI, A'dam-London, 14.00-18.08, G.M., 1, Duke.
M.A., Spad, F-CMAV, Paris-London, 16.10-18.14, G.M., Nil, Malfanti.
M.A., Breguet, F-CMAD, Paris-London, 16.45-19.00, M., 4, Rauge.

**JUNE 2nd:**

K.L., Fokker, H-NABQ, London-A'dam, 10.00-14.50, G.M., Nil, Olley.
M.A., Breguet, F-CMAC, London-Paris, 10.13-12.58, G., Nil, Briere.
H.P., HP, G-EATM, London-Paris, 12.40-1547, M., 10, Rogers.
S.N., DH9, O-BELG, London-Brussels, 12.54-15.44, G.M., 2, Van Opstal.
G.E., Goliath, F-FHMY, London-Paris, 12.55-15.45, G., 12, Bechler & 1.
K.L., Fokker, H-NABI, London-A'dam, 13.52-19.12, Nil, 3, Duke.
M.A., Spad, F-CMAV, London-Paris, 15.51-18.20, G., Nil, Malfanti.
M.A., Breguet, F-CMAD, London-Paris, 16.00-18.30, Nil, 1, Rauge.
M.A., Breguet, F-CMAK, Paris-London, 10.20-13.11, G.M., 1, Perignon.
I.L., Vimy, G-EASI, Paris-London, 11.25-14.20, G., 11, Chattaway.
H.P., HP, G-EATK, Paris-London, 11.33-14.41, G., 6, McIntosh & 1.
S.N., DH9, O-BATA, Brussels-London, 11.55-13.54, G.M., Nil, Catta.
M.A., Spad, F-CMAY, Paris-London, 13.05-15.30, G.M., Nil, Delily.
G.E., Goliath, F-GEAC, Paris-London, 13.20-16.25, G., 12, Labouchere & 1
K.L., Fokker, H-NABT, A'dam-London, 14.00-16.51, G.M., 1, Holmes.
M.A., Spad, F-ACMA, Paris-London, 16.35-19.40, M., 5, Paille.

**JUNE 3rd:**

M.A., Breguet, F-CMAK, London-Paris, 10.20-16.55, G., 3, Perignon.
K.L., Fokker, H-NABT, London-A'dam, 10.27-15.33, G.M., 2, Holmes.
I.L., Vimy, G-EASI, London-Paris, 12.30-15.20, G.M., 11, Chattaway
I.L., DH18, G-EARO, London-Paris, 15.00-17.35, G., 8, Powell.
S.N., DH9, O-BATA, London-Brussels, 16.47—, G.M., 1, Catta.
M.A., Spad, F-CMAY, London-Paris, 14.30—, Nil, 1, Delily.
M.A., Breguet, F-CMAI, Paris-London, 09.50-15.00/4th, G., Nil, Revenue.
H.P., HP, G-EATM, Paris-London, 11.05-18.59, Nil, 10, Rogers.
S.N., DH9, O-BELG, Brussels-London, 11.56-11.02/4th, G., Nil, Sahnovsky
G.E., Goliath, F-FHMU, Paris-London, 12.50-16.09, G., 12, Favreau & 1.
M.A., Breguet, F-CMAB, Paris-London, 12.45-16.25, G.M., Nil, Delage.
K.L., Fokker, H-NABQ, A'dam-London, 14.00-16.56, G.M., 3, Olley.
M.A., Spad, F-ACMH, Paris-London, 17.00-16.33/4th, Nil, 3, Charpentier.

**JUNE 4th:**

M.A., Spad, F-ACMA, London-Paris, 10.20-12.40, G., 3, Paille.
M.A., Breguet, F-CMAB, London-Paris, 10.21-13.10, Nil, 2, Delage.
I.L., DH4, G-EAMU, London-Paris, 11.20-16.50, Nil, 2, Robins.
A.D., DH9a, G-EAXC, London-Brussels, 11.20-16.51, Nil, Nil, Pearcey.
H.P., HP, G-EATK, London-Paris, 11.51-14.50, G., 10, McIntosh & 1.
H.P., HP, G-EATN, London-Paris, 12.27-15.35, M., 10, Rogers & 1.
K.L., Fokker, H-NABQ, London-A'dam, 12.50-17.00, G.M., 1, Olley.
G.E., Goliath, F-FHMU, London-Paris, 13.12-16.00, G., 9, Favreau & 1.
G.E., Goliath, F-GEAC, London-Paris, 13.35-15.25, G., 10, Labouchere & 1
S.N., DH9, O-BELG, London-Brussels, 12.50-16.57, G., 1, Sahnovsky.
I L., Vimy, G-EASI, London-Paris, 17.30-20.10, Nil, 6, Barnard.
M.A., Breguet, F-CMAC, Paris-London, 11.05-16.35, G.M., 3, Donelin.
I.L., Vimy, G-EASI, Paris-London, 11.08-14.00, G., 11, Chattaway
S.N., DH4, O-BARI, Brussels-London, 11.51-16.35, G.M. ,2, Van Opstal.
M.A., Breguet, F-CMAQ, Paris-London, 13.13-11.50/5th, G., Nil, Portal.
K.L., Fokker, H-NABI, A'dam-London, 14.00-17.30, G.M., Nil, Duke.
M.A., Spad, F-ACMF, Paris-London, 16.20-14.58/5th, G.M., 5, Briere.

**JUNE 5th:**

M.A., Spad, F-ACMH, London-Paris, 11.15-13.35, Nil, 3, Charpentier.
I.L., DH18, G-EARO, Paris-London, 12.05-14.42, Nil. 8, Powell.
I.L., Vimy, G-EASI, Paris-London, 18.55-22.08, Nil, 6, Barnard.

### Inland Flying at Croydon.

May 30th.—Nil.

May 31st.—H.P., HP test (Wilcockson).

June 1st.—De Hav. 2 DH9s from Stag Lane return (Cobham and Hatchett); various trips to Epsom on Traffic Control; C.A., DH18 from Stag Lane (Hatchett); I.L., "Bat" tests (Barnard); DH4 test and to Didsbury (Barnard); H.P. DH4 Lympne return (Rogers); H.P. tests G-EATM (Rogers); P.O. "Camel" Northolt return (Broad).

June 2nd.—I.L., DH4, from Didsbury (Barnard); C.A., DH18 test (Barnard); S.F., Avro joy-rides (Muir).

June 3rd.—I.L., DH18, test (Barnard); "Bat" tests (Robins).

June 4th.—S.F. Avro joy-rides (Muir and Hayns); G.E. "Goliath," test (Labouchere).

June 5th.—I.L., "Bat" test (Powell); S.F., Avros joy-rides (Muir and Hayns).

### Air Port Statistics.

CONTINENTAL.

Machines, 85; Passengers, 339; Crews, 101; Total Personnel, 440.
Corresponding week, 1920:—
Machines, 89; Passengers, 126; Crews, 100; Total Personnel, 226.

### The London Terminal Aerodrome.

Wednesday was a very busy day. Two D.H.9s belonging to the De Havilland Aircraft Company were in and out of the aerodrome all day. They had been regulating the progress of a number of vehicles conveying thousands of people to Epsom, where, one learns, there was some sort of horse race (or performing animals of some kind). One gathered from conversation overheard in the train that it was called the "Durby" and that there was a horse called "Pewker Sayhib" that was going to win. One learnt from a spectator that that particular horse passed over Tattenham Corner about Sunday and is expected to arrive at the winning post shortly after these notes appear. There were no passengers, goods or mail.

About lunch time Mr. Barnard took one for a test flight in the D.H.4, now named "City of York." The flight consisted of hedge-hopping, zooms and dives, and one obtained a tremendous sensation of speed, when, after a steep dive, Mr. Barnard took the machine "all out" across the aerodrome about 10 feet off the ground. The speed indicator, which is not unduly optimistic, showed 138 m.p.h.

The new D.H.18 returned from Stag Lane soon after 16.00 hrs. and at the same time Mr. Broad arrived from Northolt on a "Camel," which is his own private property, signifying his arrival by a nice clean roll.

After tea he returned to Northolt after giving a pretty exhibition of "Camel" flying, a feature which was once common at Croydon but has not been seen since the Armistice.

Mr. Broad has taken his "Camel" to Swansea, where he is giving exhibitions in conjunction with the Welsh Aviation Co., after which he will give exhibition flights in various parts of the country. He hopes to visit Croydon on Sundays occasionally and give exhibitions. One hopes that he will be able to pay the first visit fairly soon. Incidentally it may be mentioned that he has entered the machine for the Aerial Derby.

Mr. Butler, who flew his own private Bristol "Tourer" to the South of France about two months or so ago, reached the aerodrome on his return flight during the afternoon. He came over the aerodrome at a considerable height and made a perfect landing. Considering the amount of flying he has done (it will be remembered that he is a post-war pilot) his return flight to the Riviera is quite a remarkable performance and reflects great credit on the pilot, the machine and the "Puma" engine.

On Saturday Mr. Malfanti, carrying mails from Paris to London, had a forced landing in a fog and unfortunately broke his legs. Everyone will sympathise with him for he is a popular figure at the aerodrome and a war-time "ace."

M. Bouderie was married on Saturday afternoon after dispatching his "Goliaths" with full loads to Paris in the excellent hands of MM. Labouchère and Favreau. One offers best congratulations to M. and Mme. Bouderie for the future.

It is interesting to record that in the first number of THE AEROPLANE, published ten years ago to-day, in the Brooklands Notes for the week it is recorded that M. Labouchère, even then an old and tried pilot, was flying well on the Antoinette monoplane. He was then a most skilful pilot of that somewhat difficult machine, even as he is now a very fine "Goliath" pilot.

One is told that the 3-engined "Goliath" vibrates too much owing to the mounting of the centre engine This is, so one is told, "*trés mauvais*" for the passengers. Only about 10 km. in speed is added by the extra engine, so that it is unlikely to replace the present so excellent twin-engined machines.

A certain pilot at the aerodrome informed one last week that reading one's Croydon Notes in THE AEROPLANE quite put him off his lunch. As the said pilot insists on eating unwholesome vegetables for tea, one is writing this week in the hope that these notes will have the same beneficial effect on his tea.

### THE MOORING MAST AND PETROL PUMP.

The mooring mast is rapidly taking shape, and on Monday evening this week was about thirty feet in height. Probably by the time these notes are read it will be nearly completed. It is made of wood fixed together by huge steel angle brackets and is stayed by guys which will hold it about one-third of the way from the top. The lower ends of these guys are fixed to blocks of concrete sunk in the ground on the circumference of a circle, of about 100 yards diameter, of which the mast is the centre.

The petrol pump is now in operation. It is a pity that only one machine can be filled at once, because, as everyone expected, at a given moment every single machine on the aerodrome suddenly decides that it cannot exist a moment longer unless it is filled with petrol at once. Consequently the petrol fight results in the survival and departure first of the fittest.

### THE INSTONE AIR LINE.

Mr. Robbins has now joined the I.A.L. as pilot. Both the Instone Air Line and Mr. Robbins are to be congratulated on having obtained one another. He will be remembered as one of the foremost A.T. and T. pilots and recently he has been test pilot to the Aircraft Disposal Company.

The I.A.L. are now running special day trips to Paris on Thursdays and a regular daily service to Paris is almost an accomplished fact.

Mr. Barnard, who had been taking an *Evening News* photographer in the "Bat" over that Epsom horse race, took the D.H.4 to Manchester on Wednesday, carrying the photographs of the race. He returned the following day. On the same day Mr. Hatchett delivered the new D.H.18, which Mr. Barnard had on test the following day. Taking off down the aerodrome he was about 700 feet up as he passed out over the tram lines.

Messrs. Chattaway and Powell took the "Vimy" and the D.H.18 respectively to Paris on Friday with full loads. The "Vimy" returned on Saturday and left again in the evening carrying a Mr. Donoghue and suite. Mr. Donoghue is a racing driver of high speed horses, and he flew to Paris after driving a not-so-fast horse at Kempton in the afternoon. After driving a fastest-but-one horse in a Paris race on Sunday he left Paris at 18.55, landing in the dusk at Croydon at 22.08. The whole suite seemed very glad they had arrived.

On Saturday Mr. Robbins took the D.H.4 to Paris on a special trip. On Sunday Mr. Powell made a couple of test flights on the "Bat," making his usual faultless lands.

On Monday of this week the D.H.18 departed for Paris and Mr. Robins returned on the D.H.4. Incidentally Mr. Robins informs one that his name is as now spelt and that all extra "bees and enns" that have appeared in his name both in this paper and elsewhere are hereby cancelled. This order is retrospective.

In the afternoon Mr. Barnard flew the "Vimy" to Hendon with Mr. Robins in the pilot's seat, during which time he gave the latter instruction on that machine and on return carried out one or two landings.

### THE SURREY FLYING SERVICES.

Though the weather has been very dull for some time, which has caused something of a slump in joy-riding, Mr. Muir and Mr. Hayns had several passengers on Saturday and were quite busy on Sunday.

On Wednesday a photographer had booked the machine to photograph the aforesaid horse race He scratched about 10 minutes before, however, so Mr. Muir was a non-starter.

Mr. Muir has a contract with the Aircraft Disposal Company to deliver a number of D.H.4s. to Belgium. He and Mr. Hayns were to take the first two machines on Monday and Tuesday of this week, passports permitting.

### THE FLYING DUTCHMEN.

The running of a second service per day to Amsterdam which should have come into operation last Wednesday has been postponed.

The fare between London and Amsterdam has been reduced from ten guineas to eight guineas.

Master Leverton, *ætat* 12 months or so, has evidently been informed of the Government's offer to give away the airships, for on the appearance of the R.33 recently he demanded in no uncertain voice that the ship should be handed over to him immediately. He also insists on addressing it as "Da" and hails it as though it were a taxi.

Meanwhile Messrs. Holmes, Olley, Duke, and Hofstra continue to operate the machines of the K.L.M. with remarkable success.

### H.P. TRANSPORT.

Handley Page Transport Ltd. have certainly had the worst of luck since they transferred to the Air Port of Croydon. After running all the time since March with only one forced landing they inaugurated their move by several interrupted journeys in a week. One machine got back to Croydon without damage, another came down at Lympne, and another sat in a a field near Rye, and it was rumoured that another landed somewhere between Boulogne and Paris. Fortunately nobody was hurt.

The get-off up hill at Croydon when there is a South-East to South-West wind seems to worry the "Handley-Pops" a good deal. Apparently the climbing angle of the hill is somewhere near that of the machine when fully loaded. Last week one machine cleared the roof of the Custom House with considerable success, but on doing a flat turn to the left to go down-wind towards Biggin Hill it descended on a field still higher up the hill towards Purley and alighted gracefully while still flying its hardest. It was towed back to the aerodrome and lightened of some of its load, after which it got away.

One of the joys of the aerodrome is the Handley Page "moving staircase" invented to help passengers get into and out of the H.Ps. and thus named by Mr. Brenard. It consists of a kind of pulpit with steps and is "moved" by two men who carry it around and plank it up against the door of any H.P. machine which arrives on the aerodrome. The passengers do their own walking.

On Wednesday evening Mr. Wilcockson having landed at Lympne and having had spares conveyed to him in a D.H.4 by Mr. Rogers, restarted and arrived at Croydon after tea, making a very pretty landing, immediately preceded by Mr. Rogers on the D.H.4.

The following day Mr. McIntosh also put in an appearance. On Saturday Mr. McIntosh left soon after 11.30 with a full load followed by Mr. Wilcockson at 12.30. Mr. Cogni, as traffic manager, cheers the machines off.

Mr. McIntosh arrived back from Paris on Monday of this week after a very rough trip, there being a very strong wind blowing, and Mr. Rogers got in about 16.15 Just before this Mr. Perry had the D.H.4a (G.EAWH) up for a test flight, taking the machine off at a steep angle.

When Mr. Rogers landed it was seen that the wind was so strong that the 0/400 for a moment was standing quite still on the ground with engines running hard and tail well up. The speed of the wind must have been approximately equal to the flying speed of the machine.

The W.8 is being prepared for the service as speedily as possible, and it is expected to reach Croydon in about a fortnight. The difficulty of obtaining engines has apparently been solved.

### THE TRUST HOUSE.

Judging from remarks heard in the lounge of the Trust House, it seems that it would be a paying proposition for the management to provide Mrs. Middleton with an ice-making machine. In the really hot weather iced drinks are very welcome and ice creams for tea and during the afternoons generally would be extremely popular.

Only those who have held the thankless job of mess secretary in the Services can in any degree hope to appreciate the difficulties under which Mrs. Middleton operates the Trust House. If one lunches and dines day after day in the same place one can always find fault anywhere, so naturally Mrs.

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leads the way

*From "Aerial Age," May 23rd, 1921.*

**Aeronautics in Honduras.**

For the first time in the history of Honduras, an aeroplane flew over this mountainous Central American country. As a matter of fact it is the first aeroplane that flies in Central America from one city to another, for although a Mexican machine has been in the Republic of Salvador for the last three years, and some aeroplanes have for some time past been introduced in Guatemala and Costa Rica, their flights have been limited to short exhibits over the respective capitals, but never have they flown from one city to another.

This new feat has been accomplished to-day, 19th April, 1921, when a "Bristol" machine flew from San Pedro Sula on the north coast of Honduras to Tegucigalpa, the capital of the Republic. The distance is 216 miles and it was covered in 84 minutes.

The machine was piloted by the Canadian aviator Ivan Dean Lamb, and reached a height of 18,000 feet, passing over some of the highest mountains in Honduras through a very dense fog which at times made flying exceedingly difficult.

Some of the Indians living in the mountains received the scare of their life when, for the first time, they saw that big "bird" cut the air at such a terrific speed. As the day before a rather strong earthquake had been felt, some of the natives thought the "bird" was some ill omen that was bringing the wrath of the elements over the country.

This first aeroplane will be for the present attached to the War Department, but as soon as another machine is brought over, both will be used, in peace times, for carrying mails from coast to coast. Let it be said that this distance of 216 miles, covered by the "Bristol" in 84 minutes, is usually covered in FIVE days, by motor car from Tegucigalpa to Comayagua, by mule from Comayagua to Lake Yojoa, by launch across the lake, thence again by mule to Potrerillos, and finally from Potrerillos by train to San Pedro Sula. The usefulness of an aeroplane service is therefore readily understood when comparing the time saved by using the air route.

Both President Lopez Gutierrez and the Minister of War, General Carlos Lagos, have been great enthusiasts of aviation, and this day has marked a great moment in the history of Honduras.

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Middleton gets her fair share of complaints and nobody realises the shortcomings more than does she, yet it must be admitted by even the worst grousers that under existing circumstances she has made no small success, and now that the number who use the house have increased perhaps the management will see their way to put in proper cooking facilities. Also the rate of service behind the counter might be accelerated. The waitresses do their best, but the kitchen operations seem slow owing to lack of facilities.

An improvement in the teas could be made by the usual method of allowing anyone to have as much as they want to eat on paying their fixed sum. This would be balanced by those who only have about one cake. Of course the present system of buying a single cake could still exist for the aerodrome habitués.—G. D.

## Dumfries.

### RECORD PASSENGER WORK.

It seems probable that another passenger-carrying record, was put up round about Whitsuntide by the Berkshire Aviation Tours, a pleasure-flying concern which is run in alliance with the Berkshire Aviation Company. In ten days' flying at Dumfries, 1,050 passengers were taken up. This was the first time passenger flying had been done at Dumfries, despite the fact that the town is famous as the source of production of the Beardmore aero engine, and later of the B.H.P., the former engine being built by the famous Arrol Johnston Company and the latter by its offshoot, the Galloway Engineering Company. Possibly this close association with aircraft accounted for the enthusiasm of the populace.

The most remarkable feature about it was that the whole 1,050 passengers were taken aloft two at a time in one Avro biplane by one pilot, Mr. O. P. Jones—incidentally *not* the Mr. Jones who has gone to China.

One hundred passengers a day means at least 50 flights a day, and allowing only ten minutes between flights throughout the day this works out at over eight hours a day on and over the aerodrome for one pilot, one machine and one engine, for ten days on end. This may be taken as an example of what can be done by people who have to work for their livings in contrast with subsidised air lines whose machines and pilots do anything between five and fifteen hours' work per week.

Following on this extraordinary performance Mr. Jones took up 800 passengers in three days at Annan, a town of only 4,000 to 5,000 inhabitants. His total up to last week was 7,820 passengers, which must be a record for one pilot.

This week the firm is at Lanark, on the old aerodrome where Scotland's first aviation meeting was held in 1910, and where "oneself" inaugurated the great game of crashing.

## AIRCRAFT IN PARLIAMENT

On May 24th Capt. GUEST informed Lieut.-Com. KENWORTHY that the developments of the helicopter experiments "are not yet sufficiently advanced to show definite results, but as soon as they are obtained, full information will be given." Capt. GUEST also hazarded the opinion that "anyone who solves this problem will be sufficiently rewarded by the patents which he will receive." One take leave to disagree on this point. There are many of those who solved the problem of flying who have been inadequately rewarded.

Replying to Mr. RAPER, Capt. Guest said "that a sufficient sum has been allocated to enable these promising experiments to be continued." Capt. GUEST'S reply to a further question by Mr. RAPER as to the subsidising of British Air Lines was made the subject of a leading article last week.

On the subject of Air Worthiness Certificates Capt. GUEST informed Mr. RAPER that "every aircraft engaged in international navigation must be provided with a certificate of airworthiness issued or rendered valid by the State whose nationality the aircraft possesses." Also that "the individual States are responsible for determining the conditions under which their certificates may be granted."

Replying to a supplementary question by Mr. RAPER as to whether certificates held by the French machines show that they are all of equal efficiency with the British machines, Capt. GUEST said that he hoped that "the negotiations will terminate in that sense."

On the same day Lieut.-Com. KENWORTHY urged in the debate on the Naval Estimates that there was need of closer co-ordination between the Navy and the Army and the Air Force, and that it would be much better if the Naval Staff College, were situated at or near Camberly.

On May 25th, Capt. GUEST informed Mr. GILBERT that the Thames between Westminster and Albert Bridges is considered the most suitable portion for an air station, and that if used for mail carrying the work would be done by commercial services.

Replying to Mr. RAPER, Lieut.-Col. STANLEY, Financial Secretary to the War Office, said that Sandhurst Cadets on being granted commissions receive an outfit allowance of £50 with a camp kit allowance of £7 10s., together with a free issue of a revolver, binoculars and prismatic compasses, making a total value of £72 15s The kit allowance is only calculated to cover field service kit.

On June 2nd, Capt. GUEST informed Mr. RAPER that "no exact sum has been allocated" for experiments with the Brennan helicopter. The work is being done by the Royal Aircraft Establishment, and the progress of the experiments will not be hampered by lack of funds. No other practical proposal for a helicopter has been received by the Air Ministry.

Mr. RAPER asked the Air Minister whether he was aware that "although the scheme issued by the French authorities to encourage approved pilots to maintain their practical association with flying by means of giving free loan of machines for flights, free fuel, and even free insurance of the aviator while in the air, has only been in force for a very little time, already considerably over one thousand practice flights have been made at Orley, Angers, and Clermont-Ferrand?" Capt. GUEST said that "the French treat their Reserve pilots in exactly the same way as serving personnel, and that the period is actually reckoned as service. There is, at present, no authority to form an Air Force Reserve of pilots, but the Regulations to establish one will, it is hoped, be approved and issued shortly. It is not considered that provision, from public funds, of free facilities for flying, in the case of officers who have no Reserve liability, would be justified."

Capt. GUEST informed Mr. RAPER that "Although the cross-Channel Aeroplane Service is in operation, some minor points in relation to the legal Agreement are even now not finally settled, but, as soon as the document is signed, copies of it will be laid before the House."

Replying to Mr. HURD, Capt. GUEST said that "Various schemes for the development of air communications in the West Indies have been closely examined by the Air Ministry The main difficulty is that of finance. Since the summer of 1920 the Bermuda and West Atlantic Aviation Company have been carrying out valuable pioneer work in the Bermudas, and it is understood that proposals are now being considered for a service between the Bahamas and the mainland."

## PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]

### ENGAGEMENTS.

DIGBY JOHNSON—BEECHING.—The marriage arranged between Flt. Lieut. E. Digby Johnson, A.F.C., R.A.F., and Marjorie, daughter of Mr and Mrs. Harold Beeching, of Tunbridge Wells, will take place on July 16th.

HETHERINGTON—BARTOLUCCI.—A marriage has been arranged and will shortly take place between Sqn. Ldr. T. G. Hetherington, C.B.E, R.A.F. (late 18th Royal Hussars), younger son of Thomas Hetherington, J.P., of Abberton Manor, Colchester, and Clementine, elder daughter of the late T. D. Bartolucci, of Cantiano, Italy

### MARRIAGES.

BOYD—TUDOR.—On May 26th, at St. Peter's. Cranley Gardens, Major O. T. Boyd, O.B.E., M.C., A.F.C., son of the late Alfred B. P. Boyd, of Buenos Aires, and of Mrs. Boyd, High Beech, Haslemere, to Ina Marjorie, eldest daughter of Mr. and Mrs. Harry Tudor, of Upwood Park House, Caterham, and Buenos Aires.

PEARCE—HALL.—On June 2nd at St. Augustine's Church, Edgbaston (by the Rev. Dennis Tyndall, M.C.), A. Dennison Pearce, late R.F.C. and R.A.F., younger son of Mr and Mrs. H. B. Pearce, Sandon Road, Edgbaston, to Nora Emmeline, younger daughter of the late Leonard Hall and Mrs Hall, of 56, Hagley Road, Edgbaston.

### BIRTH.

TRENCHARD.—On June 6th, at Dancers Hill House, Barnet, Herts, the wife of Air-Marshal Sir Hugh Trenchard, of a son.

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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... ... ... ... 537
Aircraft Disposal Co., Ltd., The ... ... 534
Arrol-Johnston, Ltd. ... ... ... Front Cover
Auster, Ltd. ... ... ... ... ... Front Cover
Beardmore, William, & Co., Ltd. ... ... 529
Bray, Gibb & Co., Ltd. ... .. ... ... 538
Bristol Aeroplane Co., Ltd. ... ... ... 537
Brown Brothers, Ltd. ... ... ... ... 539
Cunard Line ... ... ... ... ... ... ... 540
De Havilland Aircraft Co., Ltd., The... ... 531
Fairey Aviation Co., Ltd., The ... ... ... 519
Falcon Airscrew Co. ... ... .. ... 537
Firth, Thos., & Sons, Ltd. ... ... ... 531
Green Engine Co., Ltd. ... ... ... Back Cover
Instone Air Line ... ... ... ... Front Cover
Napier, D., & Son, Ltd ... ... ... ... 521
Naylor Brothers (London), Ltd. ... ... 540
Nieuport and General Aircraft Co., Ltd. ... 534
MacLennan, John, & Co.... ... ... Front Cover
Palmer Tyre, Ltd. ... ... ... ... ... ... 527
Roe, A. V., & Co., Ltd. ... ...Inside Front Cover
Rolls-Royce, Ltd. ... ... ... ... ... 523
Rubery, Owen & Co. ... ... ... ... 539
Sankey, J. H., & Son, Ltd. ... ... ... 539
Supermarine Aviation Works, Ltd., The Back Cover
Titanine, Ltd. Front Cover & Inside Back Cover
Vickers, Ltd.... ... ... ... ... ... 524
Wireless Press, Ltd. ... ... ... ... 539

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# THE AEROPLANE

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## ON THE AIRSHIP QUESTION.

What is to be done about the airships? To anybody who has seen the vast establishments at Howden, Pulham and Cardington, to say nothing of the airship factories of Vickers Ltd., Beardmore, and Armstrong-Whitworth, it seems nothing short of criminal that the material, knowledge and skill which they indicate should be scrapped.

In the present state of general trade and of the Nation's finances it is necessarily difficult to find enough money to keep all or any of these establishments going. But surely it is better to spend some of the Nation's money on keeping the nucleus of an airship fleet and of an airship production establishment than it is to throw the money away in unemployment doles to people who do not want to work.

One suggests that the Department of Civil Aviation might invite *all* Members of Parliament to visit Pulham and Cardington. M.Ps.—despite last week's vote against free income tax and free railway tickets—dearly love free trips, and if only one-third of the House could be induced to visit the airship centres and see for themselves what airships really mean it is practically certain that enough money would be forthcoming to maintain a nucleus crew and staff for these establishments. Speaking from personal experience one can assert that one visit to an airship station is far more convincing than a dozen airships overhead or than half a dozen at mooring masts.

Given that only a fixed sum is available for the Air Ministry and that the said sum is inadequate for even the really necessary aeroplane programme it is obvious that such money must be spent on aeroplanes. But is it not possible that a small Supplementary Vote might be introduced specially for airship work? Or could not the money which is being wasted directly and indirectly on subsidising inefficient Civil Aviation be applied to airships?

Undoubtedly airships are a necessary part of the Navy's equipment and if the Coastal Area Command R.A.F. were fully in sympathy with the Navy's wants, or, if already in sympathy, were fully in touch with advanced Naval ideas, the said Coastal Area Command would refuse to exist without an airship establishment proportionate to the Navy's needs. There should be at least one big rigid airship to each of the Fleets—Home, Atlantic, Pacific, Mediterranean, or what not—which constitute the fighting force of the Navy

The mooring mast has revolutionised the use of the airship. With mooring masts we can establish airship bases at Singapore, Fiji, Port Darwin, Sydney, Melbourne or anywhere desired. In fact experience with mooring masts has proved conclusively that a modern rigid airship can cruise with a Fleet in being and that when the Fleet is at anchor it can moor to a ship from which it can be re-gassed and refuelled. Broken down engines and defective gas-bags can be changed while moored in the open, either to a mast or to a ship. And there is no need for an airship to go into a shed more than once a year, for a general overhaul and for the fitting of a new fabric envelope. So much is proven and so much means that the Navy must take an entirely new view of airships.

Granted that in a modern naval war against a modern fleet the present airship would be an easy victim to high-speed fighting aeroplanes if caught napping, nevertheless properly handled and skilfully fought a big ship would stand a fair chance of escape. At any rate it would stand a better chance of getting its information back to its fleet than would any light cruiser or destroyer which was sent on a similar scouting errand and was attacked by the same fighting aeroplanes plus torpedo and bombing machines, which latter types would never reach the airship's altitude.

With the advent of helium, and before that with the aid of blankets of inert gas, the airship will be by no means easily destroyed by fighting aeroplanes. And even in its present vulnerable state an airship costs so much less than a sea ship that we could well afford to lose a whole fleet of airships and still be better off in every way than if we lost a single light cruiser or flotilla leader.

There are many Naval officers of the modern school who realise these facts and deplore the loss of our airships. Therefore, if the Air Ministry cannot support an airship fleet—which is fairly obvious—one suggests that the best thing the airship personnel can do is to go and sit on the steps of the Admiralty till they are asked to come inside. The Navy can well afford to maintain the whole airship fleet which is now about to be scrapped. Despite all that most of it did not do in the Great War the Navy is still the spoilt child of John Citizen and can always get what it wants by crying for it.

The U.S. Navy will shortly acquire our latest and best airship, R.38, which will probably be the finest airship in the World despite the fact that she ought to have double her present horse-power. Cannot the Navy afford to pay for the completion of R.37 and modify her equipment so as to make her still a better ship?

The U.S. Navy pays its airship personnel in proportion to the length of the ships which they command, taking the "Blimp" as the unit for ordinary Navy pay. It is alleged by our poorly paid R.A.F. officers that the skipper of R.38 draws something between £3,000 and £4,000 per annum, and that his second in command is better paid than one of our Air Vice-Marshals. On such a basis one can well believe that big airships will be vastly popular in the U.S. Navy. Our airship officers demand no such favours. They are content to serve on ordinary R.A.F. or R.N. pay if only their beloved ships are allowed to exist.

Finally, airship development ought to be continued if only because the airship is the only vehicle which can follow an "All Red" Route around the World to all our dispersed Dominions without alighting within foreign territory. That alone is an adequate reason for maintaining existing airship establishments.

One has no hope whatever of a consortium of our so-called "business firms" being formed to build and operate airships. We have not enough business men to see the benefit of doing it. It is apparently only in Germany where the commercial classes have the intelligence to see that patriotism and self-interest are the same thing.

None will be more pleased than oneself if this statement is proved to be untrue and libellous. But, as one believes it to be true one recommends all those who are concerned with and for the future of airships to put their trust in the British Navy.—C. G. G.

## ON THE SUBSIDY EVIL.

At no time has one been in favour of subsidising air lines, and one's objection to subsidies is materially increased by the step suddenly taken last week by Handley Page Transport Ltd.

After operating for a brief period from the London Terminal Aerodrome at Croydon it was found that the machines used by the firm had considerable difficulty in getting off the ground. As was noted in last week's AEROPLANE one machine, after just clearing the Custom House, was unable to rise over the top of the hill towards Purley, and descended in a field while still flying furiously. Since then another machine getting off down hill in a north-easterly direction, the easiest of all directions at Croydon, had to come to earth again after crossing the new Brighton road. Yet another of the firm's machines came back shortly after starting one day last week with a connecting rod blown through the crank case.

As a result Handley Page Transport Ltd. have decided to go back to Cricklewood as the starting place for their outward service. It is understood that in-coming machines will land their passengers at Croydon, and thence fly back to Cricklewood for their next outward journey.

Why this sudden step should be taken is difficult to understand, for Cricklewood is a far worse aerodrome than is Croydon as a starting place for machines which lack the ability to climb. If a machine cannot get off up the slope at Croydon it is manifestly unfit to be used as a commercial aeroplane. A bombing machine heavily loaded for a long-range raid may justifiably need a big level aerodrome from

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which to start, but commercial machines loaded for a short journey should be built to start from and alight in much smaller aerodromes than bombers. If they cannot do so they are unfit for commercial work.

Moreover, Cricklewood is a much smaller aerodrome than Croydon, and for machines which are liable to unintentional descents it is extremely dangerous, seeing that, unlike Croydon which has good open country round it, Cricklewood has a big railway junction on one side, electric tramlines on two sides, a sheet of water (the Welsh Harp) on a third, and houses almost all round it. Besides these drawbacks the hill on the east Side is steeper than the hill at Croydon. It is indeed quite probable that the accident in which the late Mr. Bager and his engineer and a passenger were killed was due to the fact that the said hill is steeper than was the climbing angle of Mr. Bager's machine.

If Croydon is considered to be dangerous for the Handley Page machines then one is strongly of the opinion that Cricklewood is very much more dangerous, at any rate for machines which perform as the Handley Pages have been performing at Croydon of late.

Admittedly Cricklewood is more conveniently situated than is any other aerodrome in the London district. This might be a perfectly adequate reason for landing at Cricklewood as the more convenient aerodrome, and starting from Croydon as the safer aerodrome. But the reverse procedure seems to demand considerable explanation.

The only reason for doing so which seems at all adequate is that by starting from Cricklewood Handley Page Transport will avoid the adverse criticisms of the pilots and others belonging to the various British and foreign firms which operate at Croydon.

It is said that in order to start from Cricklewood the maximum load of the Handley Pages for purposes of the Air Ministry's airworthiness certificate has now been reduced from 10 or 11 passengers to 8, or the equivalent weight in goods. Now the Vickers "Vimy" with the same Rolls Royce engines finds no difficulty in getting out of Croydon with 10 or a dozen passengers, and the D.H. 18s get out easily with 8 passengers to a single Napier engine. Therefore obviously the Handley Pages now in use must have deteriorated gravely since they were first produced.

One does not pretend to understand what has caused this deterioration, nor does it matter whether it is deterioration of material which cannot be improved or deterioration of labour which is incapable of effecting the necessary improvement in the material. One is, however, fairly certain that if Mr. Handley Page himself were in personal charge of the machines this state of affairs would never have been allowed to develop.

Unfortunately Mr. Page has been for some time in the United States where, if American information is correct, he has been making an eminently satisfactory deal with the U.S. Government, with the result that a number of machines with the famous Handley Page slotted wing may well be flying in America while the venerable 0/400 type machines are endeavouring to get out of Cricklewood with only 8 passengers.

It is for precisely this reason that one objects so strongly to the whole present system of subsidy. Without the subsidy these old machines would have been scrapped long ago, for obviously they could not be run on a cross-Channel air line as a commercial proposition.

If they were scrapped, either Handley Page Transport Ltd. would have to provide itself with new and efficient machines or else go out of business. Thus one sees that the sole and only result of the subsidy is to retain on the cross-Channel service a few obsolete aeroplanes which can never conceivably pay their way, which may quite possibly be a danger to their passengers and crew, and which exist only because they are a means of extracting some of the taxpayer's hard-earned money from his pocket. One urges the Department of Civil Aviation to arrange that in future the subsidy is only paid to machines which are capable of earning it on their actual merits.—C. G. G.

## ON REFORMING THE ROYAL AERO CLUB.

There is really quite high authority for the statement that no man can serve two masters. And if one man cannot serve two masters presumably it is equally true that no body of men can serve two masters, as was demonstrated in March, 1918, when the unfortunate British Army tried to do as it was told by the Politicians under Mr. Lloyd George on the one hand, and by the General Staff at the War Office on the other. Consequently there seems to be a good excuse for the failure of the much-harassed Committee of the Royal Aero Club to provide adequately for the Sport of Flying on the one hand or for the comforts of the non-aviatic members of the Club on the other.

Of course, if the Royal Aero Club were in fact a co-operative hotel, as are the various famous clubs in Pall Mall and St. James' Street, one would not dream of interfering in its internal arrangements. For example, not even a daily newspaper would have the bad taste to criticise White's or Boodle's cuisines, even if such criticism were possible, any more than a newspaper man would be justified in complaining in print about the cooking at any private house at which he might have been a suffering guest.

But the Royal Aero Club is in fact a Public Body by virtue of setting up to govern the Sport of Flying (if any) and it is even of some International importance, in that it sends delegates to the meetings of the so-called Fédération Aéronautique Internationale—that quaint body which refuses to recognise World's Records which were made by erstwhile "enemy aviators," despite the fact that the records were made before the said aviators became enemies, and refuses to admit such enemy aviators to international competitions. Consequently one is justified in discussing publicly the internal affairs of the Royal Aero Club.

It occurs to one therefore that it might be well if the Committee were to make up its collective mind, if it has one, whether the Club's interests ultimately lie in the direction of Flying or of Hotel Keeping. One feels sure that it could achieve success in either direction. A glance at the names of the eminently successful men who compose the Committee is sufficient to justify one's belief in such success—unless, of course, one subscribes to the proposition that if a number of individually competent men be elected to a committee, board, council, parliament, senate or other elective agglomeration they immediately become, *ipso facto,* a collective congenital idiot: for which proposition voluminous proof is not lacking.

But one is perfectly sure that the Committee of the Royal Aero Club cannot do justice to both Flying and Hotel Keeping. Therefore one ventures to suggest a few reforms which might be made in the arrangements of the Club which would certainly meet with the approval of many members, if, as seems likely, it is decided that Hotel Keeping is the true *métier* of the Committee (collectively).

### A Few Suggestions.

Looking at the matter purely from the Hotel Keeping point of view it is a lamentable fact that there are some few members of the Club who despite all possible discouragement are still interested in aviation, and who in consequence have the bad taste to talk aviation "shop" on the Club premises. It is, one believes, a rule of the Club that the Club premises must not be used for business purposes, and surely discussing aviation ought to be considered a contravention of that rule. Perhaps the Committee will consider this point and will take suitable steps to protect other members against these misguided enthusiasts. Merely warning these aeronautic tradesmen can scarcely achieve the desired effect, and so one suggests that they should be excluded from certain rooms which should be set apart for the use of other members.

Fortunately the premises of the Royal Aero Club are admirably adapted to the segregation of the members into cliques according to the interests of each section, for instead of having a few very large common-rooms, the building is divided into a number of quite small rooms of varying capacity. This adaptability might be used to advantage by devoting a room specifically to each interest according to the number of members concerned.

For example, one of the largest rooms might be allocated to those members who apparently live by selling automobiles to one another. The table cutlery might be reinforced by a few neatly plated auctioneers' gavels so that meal times might be brightened and made profitable by carrying on simultaneously, not to say tumultuously, the business of a restaurant and the sport of a motor auction mart. Thus this section of the membership might be freed from interruption by other members who on occasion divert their conversation from the serious matter of motor-cars to the trivial subject of aero-engines.

Then a smaller room might be reserved for members whose chief concern is the selling or letting of household accommodation. Can anything be more distracting when a man is discussing an eligible family residence or an elegant messuage or is on the point of fixing an adequate (to him) premium on a service flat than to have some aviatic enthusiast break in upon his affairs with some fatuous remark concerning the maintenance of aerodromes or the construction of aeroplane sheds? Surely members should be protected against such interruptions.

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Again, a suitable portion of the premises should be set aside for golf enthusiasts. One of Mr. Pemberton Billing's "Golf Guns" fixed in a suitable position would permit members to demonstrate between courses and in the course of argument the strokes which they would have played if they had not inadvertently played the strokes which they did play. This arrangement would be an undoubted aid to appetite and digestion and might decrease the tendency to corpulence notable in some who appreciate visibly the successful efforts of the excellent Mr. Frisbee. In this way discussion of the all-important theories affecting the flight of golf-balls might progress without fear of frivolous interruption by some person who was more interested in the flight of aeroplanes.

Furthermore, by the simple process of encasing the bar with sheets of Firth's Stainless Bullet-proof Steel provision might be made for any member who might be temporarily home on leave from the delicate task of governing Ireland. It would then be possible for him to shoot up his surroundings, *more suo*, without discommoding his fellow-members and without being drawn into a futile discussion on the armament of aircraft. And undoubtedly the glittering metal, if framed as a series of mirrors, would add materially to the bar-like appearance of the appartment.

Yet again, a quite large room might be arranged for those members whose main interest is the playing of cards. Combined lunch and card tables could be built without much trouble by any disused aircraft firm, and the vital problems of Bridge could thus be solved free from interference by those who think more of bridging the Channel or bridging over international difficulties by the establishment of efficient air lines.

Naturally the billiard room, the haunt day in day out during the war of unemployed officers from the Air Board and the Ministry of Munitions, should be reserved strictly for real billiard-players who should be rigorously protected against members whose nearest interest to that absorbing occupation is a desire to talk ball-bearings and such like adjuncts to aeronautical progress. When a member is absorbed in contemplating the North-West pocket of the table it puts him off his stroke to overhear an argument about air-pockets.

If one has omitted to provide accommodation for any section of the members who consider themselves to be entitled to special consideration one tenders apologies to them, and if they will be so good as to state their requirements one will gladly forward their recommendations to the Committee. One feels sure that they will be met with every consideration.

As for those members who still insist on being interested in aviation and who still desire to discuss aircraft, one suggests that they be relegated to the cavern under the side-walk which is reached by way of the billiard-room. And naturally they would only be permitted to enter or emerge when no game was in progress. There, under the roar of the traffic without and against the click of billiard-balls and the rattle of cues and the clink of glasses and the banging of trays within, their foolish aeronautical conversation would be unlikely to disturb the majority of members of the Royal Aero Club.

### A Sporting Proposition.

When these urgent reforms had been accomplished perhaps some small portion of the Club's wealth might be detailed to encouraging the Sport of Flying, for which purpose the Club was originally founded. Perhaps a small attic might be rented where the Racing Sub-Committee, which is doing its honest best, could meet without feeling that it was occupying room which ought to be devoted to more serious affairs.

By a careful canvass of the full-page advertisers in the daily news-sheets the Sub-Committee might discover a few people who would take an interest in aeroplane racing much as Sir T. Lipton or Lord Dewar take an interest in yacht racing. Running a racing aeroplane is much cheaper than running a yacht and a real "full-pager" could by a proper exercise of diplomacy get quite as much editorial advertisement out of it. One doubts whether the proposition has ever been put in a proper manner to those who would be most likely to grasp the opportunity.

It is only fair to assume that the owners of all the famous names which appear in the list of Patrons and Stewards and on the Council of the Royal Aero Club are in these days to be reckoned among the New Poor. Therefore it would be unfair to expect them to do anything for the Sport of Flying beyond allowing their names to appear on the stationery of the Royal Aero Club as a guarantee of respectability.

But if British aeroplanes could capture the Deutsch Trophy and the Schneider Cup and the Pulitzer Trophy and the Mapelli Cup nobody concerned with aviation would care what names were borne by the winning machines. If a "Johnny Walker" monoplane designed and built by Captain de Havilland or Mr. Handasyde won the Deutsch trophy or the Pulitzer trophy both the owner and the builder would benefit thereby, especially in the Desiccated States. If a "Lux" seaplane built by the Fairey Co. or by the Supermarine Co. won the Schneider Cup, or if a still more infantile Avro than the "Baby" won the Mapelli Cup as the property of "Glaxo" or "Mellins," the Sport of Flying and the British Aircraft Industry would receive a very decided and much needed tonic.

Though this suggestion may seem foolish to some and humorous to others it is in fact quite a serious proposition. And if it were put up seriously to some of the big commercial people by a representative of the Royal Aero Club—for example by Sir Sefton Brancker, with all his persuasive eloquence—one believes it would achieve surprisingly good results.

A few big International wins would soon bring other people into the game on a smaller scale. Real sportsmen would take a hand for the fun of the thing. Groups of moderately well-to-do people would run aeroplanes much as two or more men become partners in a race-horse. And so Flying might become a live sport.

### A Chance for the Aerial Derby.

It is not too late to make a start even now. The Aerial Derby is to be flown about four weeks' hence. Fairly modern machines can be hired at a small cost. Any quantity of pilots can be had for the asking. Perhaps a few firms might be induced to put up machines for the occasion.

And, apropos the Aerial Derby, cannot a few R.A.F. Stations or squadrons on Home Service find the money among the members of their respective messes to enter machines as a station or squadron enterprise? The Air Ministry would, one feels sure, regard such a sporting effort as an indication of keenness and initiative. A matter of two or three pounds per member would allow a mess to hire a machine and put up a good show in the Handicap. There is plenty of time to make all arrangements and the Racing Sub-Committee of the Royal Aero Club will certainly do all it can to help.

The Universities ought to be able to put up machines also, but one gathers that Oxford and Cambridge are finding quite enough trouble in arranging their own little inter-University Race. So presumably nothing is to be expected from the minor Universities. Nevertheless, they will come into the game in the future.

Meantime, whether the Royal Aero Club as a whole reforms its internal economy in the manner suggested hereinbefore or whether it drifts along in its present fashion, the Racing Sub-Committee is doing its level best to make aeroplane racing into a real sport. And so one wishes every success to its efforts.—C. G. G.

## ROYAL AERO CLUB SEAPLANE RACES.

As has already been reported in THE AEROPLANE, the Royal Aero Club have organised two seaplane races to be held on August 1st and 2nd, during the Cowes Yachting Week, Monday and Tuesday being chosen apparently to make attendance more difficult, and to keep the mere vulgar mob away.

These races are to be known as the Isle of Wight Handicap, and the Solent Handicap, and are open to persons of any nationality holding a licence issued by any Aero Club affiliated with the F.A.I.

The Isle of Wight Handicap, to be held on August 1st, will be for a Trophy of the value of £100, presented by Lieut.-Col. F. K. McClean, and £250 presented by the Royal Aero Club. The course, of approximately 80 miles, will be from a point off Cowes to Ventnor, out and back twice, passing Ryde, Sea View and Foreland.

The Solent Handicap, to be held on August 2nd, will be for a prize of £250, presented by the Royal Aero Club. The course, of approximately 80 miles, will be over a circuit of 20 nautical miles, situated on the Solent, to be covered four times. The circuit will include a point off Cowes, No Man's Fort, Horse Sand Fort and Spitbank Fort.

Competitors will be started on the water at intervals according to the handicap, and the winner will be the competitor who having properly completed the course first crosses the finishing line in flight. Alighting, replenishments and repairs will be permitted *en route*.

In order to get over the difficulty of seaplane manufacturers being short of pilots, it has been reported that the Air Ministry will permit Service pilots to compete.

The Entry Fee is £5 for each competition, and this fee, together with the Entry Forms, copies of which can be obtained from the Secretary, must be received by the Royal Aero Club not later than July 20th.

## THE AERIAL DERBY.

PROBABLE RUNNERS AND PILOTS.

M. de Romanet is bringing over the new 300-h.p. Hispano engined Lumière de Monge monocoque monoplane for the race, while M. Barrault will bring over the Borel Scout.

As neither of these pilots know the course, it would be a very graceful act if some firm who has a 3-seater machine

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would undertake to fly MM. Barrault and de Romanet round the course. As they have never flown over here it would be only the sportsmanlike thing to do.

One might point out also, that besides being a graceful act, the firm concerned would get good value for their pains, by getting an excellent "news story" in the daily Press.

M. Sadi-Lecointe will fly a Nieuport, Mr. Tait-Cox or Mr. James will take "Goshawk," and Mr. Raynham will be up on the Handasyde.

Mr. Uwins will be seen on the new Bristol with "Jupiter" 400 engine and the "Bamel" of which one must not mention the pilot is almost certain to start.

Mr. Hinkler, who is now back in England, will again be seen on a "Baby," and there will be a Napier Avro probably piloted by Mr. Courtney, and possibly one with a "Puma" and another "Baby."

Mr. Broad will fly his Sopwith "Camel," on which he is now giving exhibitions in Wales, and it is probable that Mr. Harry Hawker will fly his Sopwith "Scooter," on which he performed in the Pageant last year.

Mr. Courtney assures one that he intends to fly a "Longhorn" with a Ford engine. He says he has chosen this type because he feels sure it will rain that day, and he *does* like a machine in which he can use an umbrella.—G. D.

# NAVAL AND MILITARY AERONAUTICS.

## Air Force Awards.

The King has approved of the following award to the undermentioned officer, in recognition of gallantry and devotion to duty in Mesopotamia :—

Bar to the Distinguished Flying Cross.—Flying Officer Dudley Lloyd Evans, M.C., D.F.C., R.A.F. (Distinguished Flying Cross gazetted Dec. 3rd, 1918).—For gallantry, skill and devotion to duty on Nov. 1st, 1920, while accompanying another machine on reconnaissance. Owing to engine trouble the second machine, with pilot and observer, had to make a forced landing in hostile country. A party of mounted Arabs at once started firing at the observer, who was dismantling a Lewis gun. On seeing this, Flying Officer Evans landed at great peril to himself, took both officers on his already loaded machine, and, getting off with much difficulty, returned to Headquarters.

## R.A.F. Cricket.

The Royal Air Force beat the Royal Army Ordnance Corps at the Oval on May 30th and 31st by 10 wickets. Score :—R.A.O.C. : First innings, 211 ; second innings, 240. R.A.F. : First innings, 410 ; second innings (no wkt.) 43. Sqdn. Ldr. Blount made 145 in the first innings and Group Capt. Roche 100.

## The Imperial Services Boxing Championships.

The Imperial Services Boxing Championships took place on June 6th and 7th. The results affecting the R.A.F. were :

Other Ranks.

Fly Weights.—First Series.—Pte. Marsden (R. Marines) beat A.C. 2 Lander (R.A.F.) on points.

Fly Weights.—Final Bout.—Pte. Marsden (R.M.) beat A.C.2 Burns (R.A.F.) on points.

Feather Weights.—First Series.—A.C.2 Carter (R.A.F.) beat Corporal McNamee (Army) in one round.

Feather Weights.—Second Series.—Stoker P.O. Cartlidge (R.N.) beat A.C.1 Carter (R.A.F.) on points.

Final Bout.—Stoker P.O. Cartlidge (R.N.) bea tA.C.2 Boteler (R.A.F.) on points

Bantam Weights.—First Series.—Pte. Fraser (Army) beat A.C.2 Wells (R.A.F.) on points ; Serjt. Sallows (R.A.F.) beat Corporal Fort (R. Marines) on points

Bantam Weights.—Second Series.—Pte. Fraser (Army) beat Serjt. Sallows (R.A.F.) on points.

Light Weights.—First Series.—Serjt. Stone (R.A.F.) beat P.O. Smith (R.N.) on points.

Light Weights.—Final Bout.—A.C.2 Mills (R.A.F.), beat Corpl Downton (R.M.) on points.

Middle Weights.—First Series.—S.S. Davis (Army) beat A.C.2 Higgins (R.A.F.) on points.

Welter Weights.—First Series.—Corporal Sheppard (R. Marines) beat A.C.2 Brady (R.A.F.) on points.

Welter Weights.—Final Bout.—A.B. Hall (R.N.) beat A.C.2 Hunter (R.A.F.) in the first round.

Light Heavy Weights.—First Series.—P.O. McFee (R.N.) beat A.C. Fairbrass (R.A.F.) in the 2nd round.

Light Heavy Weights.—Second Series.—Bombardier Griffin (Army) beat Corpl. Blythe (R.A.F.) on points.

Heavy Weights.—Second Series.—Guardsman Penwill (Army) beat Corpl. Leary (R.A.F.) in the second round.

Officers.

Bantam Weights.—Final Bout.—F.O. Howard (R.A.F.) beat Flt. Lieut. Hargreave (R.A.F.) in the second round.

Light Weights.—First Series.—Flt.-Lieut. Smith (R.A.F.) (holder) beat Gnr. Woodfield (R.N.) on points.

Light Weights.—Final Bout.—Flt. Lieut. Smith (R.A.F.) beat Lieut. McCann (Army) in the first round.

Middle Weights.—First Series.—Lieut. Bailey (R.N.) beat Page (R.A.F.) in the third round.

Middle Weights.—Second Series.—Lieut Schoales (Army) beat F.O. Ingram (R.A.F.) in the second round.

Welter Weights.—Second series.—Maj. Le Q. Martel (Army) beat F.O. Rowe (R.A.F.) on points.

Light Heavy Weights. — First Series. — Lieut. Crouch (Army) beat Drabble (R.A.F.) in the second round; Lieut. Page (R.N.) beat Clarke (R.A.F.) in the first round.

Heavy Weights.—First Series.—Capt. Buller (Army) beat F.O. Brady (R.A.F.) in the second round.

### Independent Force
## ROYAL AIR FORCE.

THE
THIRD ANNUAL REUNION DINNER
of the
INDEPENDENT FORCE,
Including all Officers of
Army Troops
and all other attached Units, will be held at the
HOTEL CECIL
on
Monday, June 20th, 1921,
at
19.30 for 20.00

In the Chair:
Air Marshal Sir H. M. Trenchard, Bart.,
K.C.B., D.S.O., A.D.C.

H.R.H. THE DUKE OF YORK, K.G.,
has graciously signified his intention of being present.

You are requested to bring this notice to the attention of any eligible officers who may not have received a circular.

TICKETS, Price 17/6 (excluding wines), may be obtained from :—Major T. V. Smith, M.C., or Sq., Ldr. S. M. Cleverly.

Apply to the Secretaries,
care of Room 337 E,
Alexandra House,
Kingsway, W.C.2.

*Evening Dress with Miniatures.*

The following officers have also promised to be present :—Major-General J. E. Dickie, C.B., C.M.G., Group-Captain C. L. N. Newall, C.M.G., C.B.E., A.M., Wing-Commander L. Greig, M.V.O., Wing-Commander J. H. A. Landon, D.S.O., C.B.E., Lieut.-Col. J. Waley-Cohen, C.M.G., D.S.O.

## 55 SQUADRON DINNER.

The Annual Dinner for Officers of 55 Squadron R.A.F. will take place at the Holborn Restaurant at 19.30 hours on July 2nd, the night of the Aerial Pageant. All past and present Officers of the Squadron who have not already applied for tickets are invited to do so to Squadron-Leader J. E. A. Baldwin, D.S.O., O.B.E., "T" Depot, R.A.F. Uxbridge.

## VENDOME REUNION DINNER.

Arrangements are being made to hold a reunion dinner of all Officers who served at Vendome Air Station. This will take place at the Criterion Restaurant on Friday, June 17th, 1921, at 18.45 Those wishing to attend should notify

**HAROLD FOORD, Sandy Knoll, Ewell, Surrey**
('Phones—Victoria 4210.. Epsom 319),

as soon as possible, in order that the necessary arrangements can be made.

## DUNKIRK OFFICERS' DINNER.

The THIRD ANNUAL DINNER for Officers who served in the Dunkirk Command of the Royal Naval Air Service, and the Royal Air Force, from 1914 to the Armistice, will be held at the Hotel Cecil on Wednesday, the 29th June, 1921, at 20.00 hours.

Officers are requested to arrive at the Hotel Cecil as nearly as possible to 19.30. Those who wish to be present are requested to communicate with Air Commodore G. L. Lambe, C.B., C.M.G., D.S.O., Room 716, Air Ministry, by 22nd June, as the number is limited.

Tickets £1. Envelopes should be marked "Dunkirk Dinner."

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*Constructeurs, sur commande spéciale du Gouvernement Britannique, du plus grand bateau volante construit jusqu'à ce jour.*

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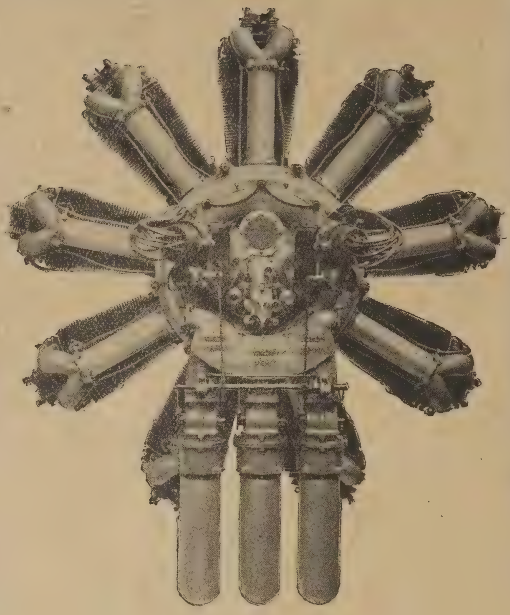

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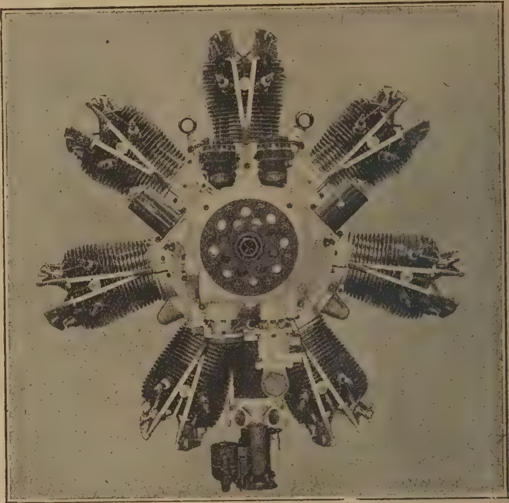

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# AERONAUTICAL ENGINEERING

## SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

The majority of those who are directly concerned with heavier-than-air work are apt to regard the airship as something which—interesting and possibly useful as it may be—has no direct bearing on the prospects of the aeroplane as a mode of transport.

An article below attempts to show that this view is erroneous, that the airship is likely to become a vital part of any comprehensive scheme of aerial transportation over long distances, and that the development of trans-Continental and trans-oceanic airship services will greatly increase the utility and therefore the prosperity of the aeroplane as a local express distributing agency.

The conclusion thus reached—that the threatened collapse of British airship enterprise will react unfavourably on the whole British Aircraft Industry—is of considerable importance.

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Following the above-mentioned article there will be found a short account of the R 38—the latest and most advanced development of the British airship—which is shortly to be handed over to the U.S. Navy.

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Japanese activity in aerial developments being somewhat in the public eye at the moment, the scale drawings and photographs of the Oguri two-seater produced in this issue should be of interest. (Pages 548 and 550.)

* * *

## THE FUTURE OF BRITISH AIRSHIPS.

In a note referring to a visit to the Cardington Airship Works which appeared in the last number of this journal some reference was made to the regrettable nature of the prospect that British work on the design and construction of airships may very shortly cease. It seems possible, even probable, that many of those readers of this paper who are mainly interested in the fortunes of heavier-than-air craft do not yet realise how important the airship is likely to become in the not far distant future, and how very severely the aeroplane, as a transport facility, is likely to be handicapped in its development if the development of the large airship is arrested.

It is in the highest degree unlikely that abandonment of airship research and construction by this country will do more than somewhat retard the development of the airship, for certainly Germany, and very probably the United States, will carry on that work. But at the present moment Britain possesses the equipment, the experience and the knowledge required for the design and construction of airships to an extent only equalled by Germany, and not approached by any other nation.

This equipment and experience has been gained at great cost. A writer in the daily Press has assessed the cost of building up our present airship equipment at £40,000,000, and it seems probable that this is a distinctly low estimate. The result of such an expenditure is not lightly to be discarded, but such a course might be justified under certain conditions. It cannot be justified in this instance if the whole question is viewed from the proper standpoint.

### The Airship's Part in Transportation.

The airship—and by airship is to be understood the large rigid type—will be an absolutely essential part of the British Empire's air communications, if air communications worthy of that name are to exist. Of present-day aerial craft only the airship offers any promise of successful operation on long distance trans-oceanic or trans-continental routes, because the airship alone can be built in sizes capable of carrying both sufficient fuel for long flights, and a sufficient load of cargo to justify operation on such journeys.

The larger one builds an airship, the more total weight per h.p. one can carry at any specified speed. Increase in size of airships does not lead to such serious difficulties in the design of the structure as occur in any attempt to build really large aeroplanes, with the result that airships very much bigger than any now existing can be built without increasing the ratio between the weight of the structure itself and the total lift given by the completed ship.

This being so, and the h.p.—and consequently the fuel for any journey—increasing at a less rate than does the total lift, it is obvious that the bigger the airship, the greater the proportion of paying load to total weight, and the greater the number of ton miles of paying load per gallon of fuel consumed.

The reverse tends to be true of aeroplanes, and the possibilities of building an aeroplane capable of carrying 30 tons of combined crew, fuel and cargo for 500 miles are—in the present state of aeronautical knowledge—very remote. An airship to carry 30 tons of paying load across the Atlantic is by no means an impossibility—not even an improbability—and there is little room for doubt that the airship will be able continually to meet the increasing demands of growing traffic on long-distance journeys. The aeroplane does not seem likely to be able to accomplish this to anything like the same degree.

### The Main Air Lines.

Therefore it is almost inevitable, if the British Empire is to be linked up by a comprehensive system of aerial transportation, that what one may call the main line services will be carried out by airships, and the local distribution by aeroplane. That is to say, that such routes as London to Egypt, India, Australia, Canada, South Africa, etc., will be served by airship lines, making stops only at important stations—just as our passenger and mail ships stop only at important ports. The distribution of passengers and cargo over the districts served by those stopping-places will fall to the lot of the aeroplane.

Alternatively one may compare the airship with the main line express train stopping only at important junctions. Passengers alighting at such junctions are then distributed to their ultimate destinations by local train services, taxi-cabs, motor-'busses or tramways, which bear a somewhat similar relationship to the express as that which will probably be borne by the aeroplane with regard to the airship.

### Induced Traffic.

Now it is to be remarked that the local transit facilities of a great centre of population do much more than merely distribute passengers from main line expresses. It may fairly safely be asserted that nothing like half a million passengers by express trains arrive in London daily, yet the London tramways, 'buses, and electric railways cannot average much less than 5,000,000 passengers a day.

Nevertheless, those 5,000,000 daily passengers are largely the result of the existence of a great express train service converging upon London from all over the country. Deprive London of its main line railway services, without providing an adequate substitute, and London must inevitably decline as a business centre, and will become unable to support its present enormous population. Therefore its internal traffic will die out, and trams, 'buses, and tubes become derelict.

### THE AIRSHIP AND LOCAL AEROPLANE SERVICES.

In exactly the same way rapid and relatively cheap airship transport between Britain and the main cities of the British Dominions will enormously increase the business activities of all the countries served by it, and consequently the internal traffic both in this country and in the Dominions. Just as London's local transport services carry not only those who come to London by long-distance trains, but also the much vaster multitudes who are enabled to live in London by the fact that London is easily reached from all British business centres, so will the local aeroplane services carry a much larger traffic than that brought to them by the long-distance airships.

For distances of much less than 1,000 miles the airship is unlikely to compete with the aeroplane, partly owing to its low speed, but mainly because of the high initial cost of the airship itself. For distances over 1,000 miles, the aeroplane has very little chance of competing with the airship, because it cannot carry both the fuel for so long a trip and a reasonable amount of paying cargo. That is, the airship will not compete with the aeroplane.

Therefore the development of the large rigid airship is a matter of direct import to those who hope for a large development of aeroplane transport. Without the airship the aeroplane services will stand more or less in the position of a tramway or motor-'bus service serving a group of towns and villages cut off from communication with the outside world.

### THE HANDICAP OF ENGLISH WEATHER.

As already mentioned there is little risk that airships will cease to develop even if Britain abandons all attempts to develop them. Nevertheless it is of the greatest importance to the British aeroplane industry that Britain should not abandon airships. The British climate is one not altogether favourable to the development of aeroplane transport. It is even worse for airships in certain respects. In Germany, with the aid of cunningly devised mechanical handling gears it is possible to bring an airship in and out of its shed on almost any day of the year, and if it is not possible at one shed, it is probably possible at one relatively close by.

In Britain this is not the case, and it is largely because of the uncertainty of the weather and of the difficulty of handling large ships in bad English weather that our airships were regarded as somewhat mixed blessings by the Navy during the war. The mooring-mast—unfortunately developed too late to remove the resulting prejudice against airships which exists in certain naval circles—has completely solved this difficulty. This development is due entirely to British airship experts, and it makes it possible to operate airship lines radiating from Britain without fear of serious irregularities during bad weather.

It is scarcely likely that German air lines will choose England as their central junction, particularly considering the British climate, and Germany alone, at the present moment, has the knowledge and experience of large airship construction and operation which would permit competition with Britain in this sphere of activity.

### THE PROBABLE RESULT OF BRITISH NEGLECT.

Having overcome our climatic handicap by the evolution of the mooring-mast, it is obviously absurd that we should subside and leave Germany a free hand. But, apart from that consideration, there is a very great probability, that, if the world's main airship lines are operated by Germany, the local aeroplane systems feeding and radiating from airship ports will also be German.

Such a state of affairs would doubtless ensure efficient and enterprising exploitation of air transport, but it scarcely seems likely to conduce to the prosperity of the British Aircraft Industry, of British pilots, or of British aeronautical engineers. Therefore a continuance of British effort in the design, the construction and the operation of rigid airships is of importance to the British Aircraft Industry as a whole, and it is to their interest to support to the best of their ability any practicable scheme to rescue from the scrap heap the existing equipment, and from dispersal the trained staff, which is now available for such work.

The idea that we can afford to drop airships and lose our few competent airship designers, to take up the airship business when more prosperous times arrive is a thoroughly dangerous one. Thanks to the Treaty of Versailles we are at the moment in a position to gain a start in this direction over all our rivals.

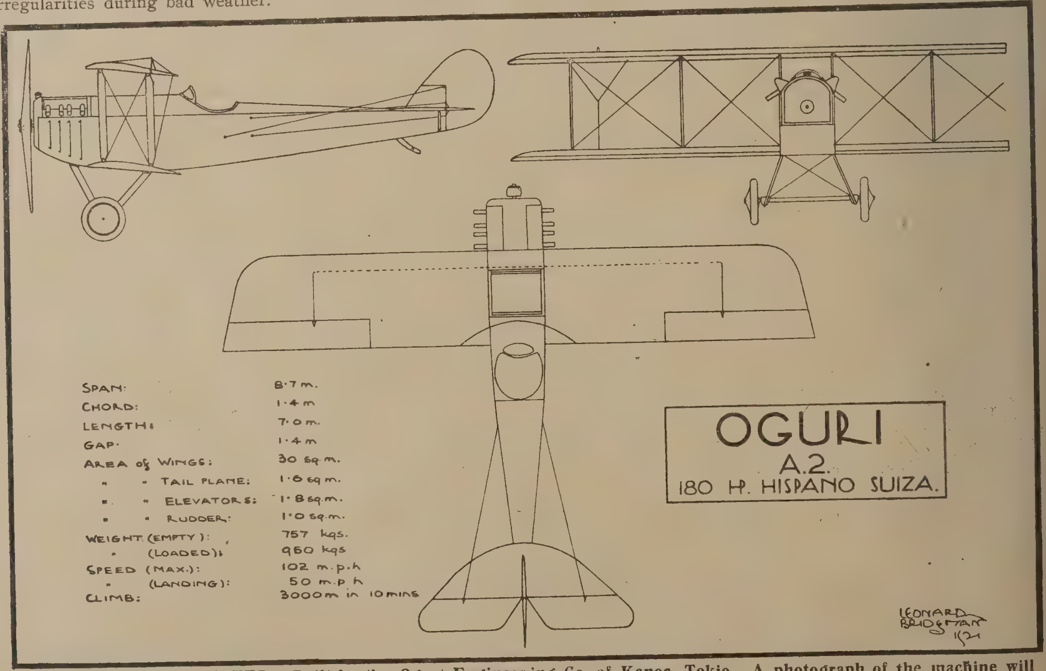
But equally thanks to that Treaty we have in Germany a rival who feels that he is being unfairly deprived of the fruits of his labours, and who is therefore the more determined to overtake us in the race for aerial supremacy. Despite the Treaty, Germany is very thoroughly equipped, and possesses unrivalled experience.

Making the most of our temporary advantage, we shall still have a stiff fight to keep level with Germany in this matter. If we drop out of the race now we stand little chance of catching up for very many years.

More than ever before the prosperity of the British Empire is dependent upon secure and economical transportation. Recovery from the economic effects of war and of the consequent industrial upheavals will be the more difficult the less rapidly our Imperial communications are improved, and the results of a sane and progressive policy in regard to airships cannot but hasten the return of prosperity.

A short-sighted parsimony in this matter is, on the contrary, likely to be productive of the most evil results.

W. H. S.



**A JAPANESE TWO-SEATER.—Built by the Oguri Engineering Co. of Kanoa, Tokio. A photograph of the machine will be found on page 550.**

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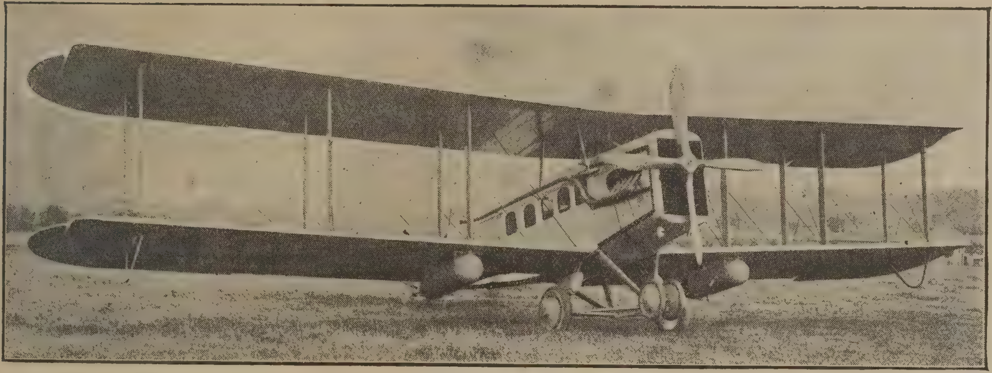

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# THE LARGEST BRITISH-BUILT AIRSHIP.

The following data relating to R.38, which has just been completed at the Royal Airship Factory at Cardington, is based on information supplied by the Department of Information of the Air Ministry. This particular airship is of very considerable interest, largely because it represents a marked advance in British airship design, but also in view of the fact that it has been completed for the American Navy and it is likely to be some appreciable time before any further British rigid airships are laid down.

It is claimed by the Department of Information that R.38—or Z.R.2 as the American Navy has christened her—is the largest airship yet built in any country. It is somewhat doubtful if this claim is tenable, for L.59, the famous Zeppelin of the African trip, was certainly considerably longer than R.38, and appears to have been of slightly greater capacity. L.59, however, was specially lengthened for long distance work, and as originally laid down was smaller than R.38.

The design of R.38 was decided upon by the Admiralty in the Spring of 1918. Construction was begun at Messrs. Short Brothers' works at Cardington in November, 1918. In April, 1920, the works at Cardington were taken over by the Air Ministry, and the greater part of the work of construction of R.38 has been carried out since that date. The history of the airship up to date may, therefore, be summarised by saying that it was designed by the Admiralty, begun by Messrs. Short Brothers and completed by the Air Ministry.

The construction of R.38 marks indeed a very definite advance in British airship practice as it is the first ship of purely British design and not merely a copy of previous German ships.

The story of German progress in rigid airships during the War is mainly a record of ever-increasing efficiency gained by constructional improvements to reduce weight both as regards hull and machinery, culminating in the production of the L.70 class, which was capable of rising to about 24,000 feet. The class to which R.38 belongs, and of which it was to be the pioneer, was intended to consist of four airships. Before work on them had progressed far the Armistice intervened and the other three airships of the class were cancelled.

The disposable lift, i.e., the useful lifting power available for petrol and oil, crew, stores, armaments, ballast, etc., as originally designed, was in excess of 50 tons as against 30 tons in the case of R.33 and R.34, but some reduction of this figure will follow from various additions which have been made, such as bow mooring gear to permit of the airship being moored to a mast.

R.38 will carry, when fully equipped for service, about 30 tons of petrol, which is sufficient for a flight at full speed (70 m.p.h.) of 5,000 miles, or a cruising speed (60 m.p.h.) of 6,500 miles.

The hull structure is, in general principles, of standard type such as was used in Zeppelin airships and in earlier British types, but a very considerable saving of structural weight has been effected by a large number of improvements in details. The framing contains 14 compartments in each of which is a gas bag made of fabric and goldbeater's-skin. Inside the bottom of the airship and running from end to end is a corridor containing the aluminium petrol tanks, the fabric water ballast bags, accommodation for bombs and the sleeping and living quarters of the crew when off duty. This corridor is also the means of communication between the various cars and control stations, and of entry from a mooring mast at the extreme bow.

The airship is driven by six two-bladed airscrews actuated by six Sunbeam "Cossack" engines of 350 h.p. Each power unit is housed in a separate car suspended below the hull by wires and is reached from the hull by means of a short ladder. The six power cars are placed in pairs, side by side, in three groups.

The main control station of the airship is in a small car near the bows. This car is not suspended below the hull as in the case of the power cars but projects from the underside of the hull structure, to which it is rigidly attached.

It is intended that after trials have been carried out and the airship has been handed over to the American Government, the American crew which is now completing airship-training in this country will, after a few further flights to accustom themselves to the behaviour of the airship, fly across the Atlantic to a base in America, where a shed has been built to accommodate the ship and where it is understood a mooring mast is also to be erected.

In view of the fact that R.38 will be the second airship to fly to America, it may be of interest to compare this ship with R.34 which carried out the first and only flight from Great Britain to America and back.

The following comparison shows clearly the improvements in the performance of airships which have been effected between the beginning of 1919, when R.34 was commissioned, and the middle of 1921 when R.38 will carry out her preliminary trial flights:—

Performance Table.

| R.34 | | R.38 | |
|---|---|---|---|
| Length | 645 ft. | Length | 695 ft. |
| Diameter | 78 ft. 9 in. | Diameter | 85 ft. 4 in. |
| Capacity | 2,000,000 c. ft. | Capacity | 2,700,000 c. ft. |
| Total lift under normal conditions | 59½ tons. | Total lift under normal conditions | 83 tons. |
| Disposable lift | 24 tons | Disposable lift | 50 tons. |
| Total horse-power | 1,250 | Total horse-power | 2,100 |
| Engines fitted | 5 Sunbeam "Maori" engines, 250 h.p. each | Engines fitted | 6 Sunbeam "Cossack" engines, 350 h.p. each. |
| Endurance at 60 m.p.h. (full speed) | 3,000 miles. | Endurance at 60 m.p.h. (cruising speed) | 6,500 miles. |
| Ceiling (maximum height) | 13,800 ft. | Ceiling (maximum height) | 25,000 ft. |

In view of the interest which is being taken at the moment in the use of airships for commercial purposes, it is worthy of note that an airship of the R.38 class, adapted for transport, could carry 40 passengers and two tons of freight in a non-stop flight to Egypt in about 48 hours.

As a result of the experience gained in the design and construction of R.38, a new design has been produced for an improved type of airship with a gas capacity of about 4,000,000 cubic feet, which would be capable of carrying 50 passengers and 13½ tons of freight on a non-stop flight to Egypt in about 40 hours.

# THE INSTITUTE OF AERONAUTICAL ENGINEERS.

NOTICES

*Council.*—The Council met on May 26th.

*Elections.*—Members: W. Kennedy Boyne (Honours Diploma); E. H. Lewitt, B.Sc. (Eng.); R. F. Galloway.

Associate Member: A. F. Houlberg.

Pilot: S. A. R. Solomon.

Associate: A. H. Ashbolt (Agent-General for Tasmania).

Student: K. Wada.

*Examinations.*—Candidates for admission who have obtained a Second Class Pass in the examination in Aeronautical Design and Engineering at the Imperial College of Science and Technology are exempt from the Intermediate Examination.

*Lectures.*—The several members who have kindly offered to lecture during the autumn should submit to the Council as soon as possible their complete MSS., or, failing those, detailed synopses of their proposed papers. Further offers of papers are invited

*Journal.*—Owing to the general trade depression publication of the June number of the journal is deferred

Douglas Shaw, Secretary.

# AIR MINISTRY NOTICE TO GROUND ENGINEERS.

No. 6, 1921.—THROTTLE CONTROL FOR NAPIER "LION" ENGINES.

It is hereby notified:—It is highly desirable that all aircraft fitted with Napier "Lion" engines with a compression ratio of 5.5 to 1 or 5.8 to 1 should be provided with an approved Gate type throttle control, with the object of limiting, in normal conditions, the travel of the throttle lever at altitudes below 5,000 feet.

In such cases a warning plate should be displayed in the pilot's cockpit to the following effect:—

> "The throttle control lever must not be moved through the Gate except when above 5,000 feet or in cases of emergency."

Attention is also drawn to the fact that propellers for such aircraft should be so designed as to allow the engine to run at 1,800 r.p.m. on the ground as a minimum.

Air Ministry, June 2nd, 1921.

**The Oguri Two-seater, the scale drawings whereof appear on page 548. The machine bears a considerable resemblance to the Curtiss J.N. type.**

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## ENGINE PERFORMANCE DATA.

The performance of a test sample of a particular engine run by its makers' experts on the test bench is in the majority of cases at least fairly comparable with similar tests on engines of another make. It does not purport to represent the performance of that engine when flying an actual aeroplane, and for certain fairly obvious reasons no test bench figures can safely be taken to serve as more than a guide to the probable behaviour of the same engine in the air.

In any case neither the engine maker nor the aeroplane designer can afford to carry out really extensive bench tests—covering a wide range of speed, and power, and various conditions of atmospheric pressure and temperature with the result that the aeroplane designer is forced to make a series of intelligent, and usually fairly successful, guesses at what the particular engine will do, say, at high altitudes.

This lack of information can be supplied to some large extent by careful investigation in a properly designed research establishment, provided adequate funds are available, and fortunately a fair amount of such work has been carried out in various countries. In particular, the American National Advisory Committee for Aeronautics has carried out many engine tests in the Altitude Laboratory at the Bureau of Standards, Washington, and a very complete resumé of the results of certain of these tests is given in Report No. 109 of that body.

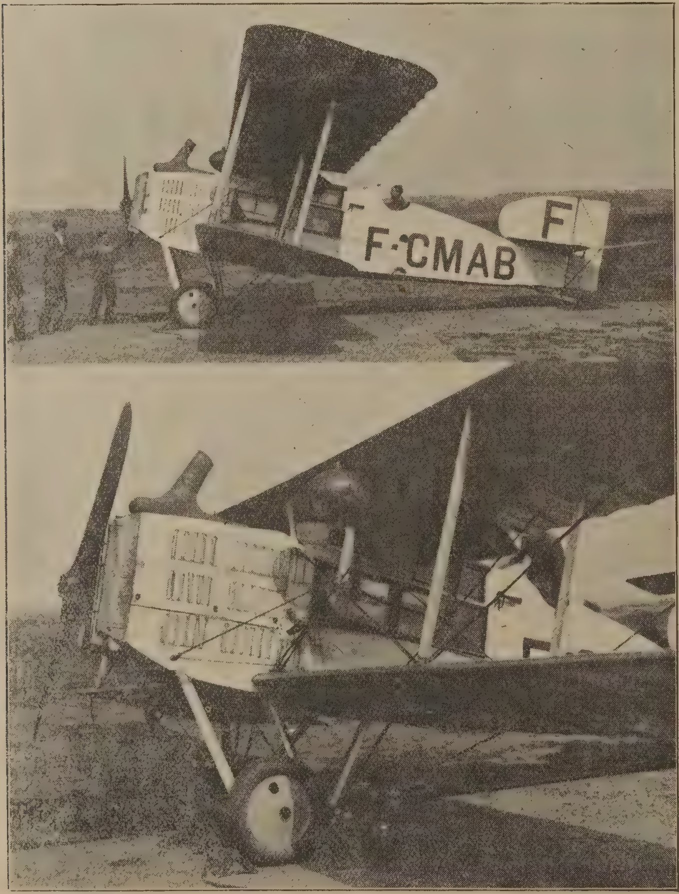
This report is based upon an analysis of a large number of aero-engine tests made at the Bureau of Standards. The report contains the results of a search for fundamental relations between the many variables of engine operation.

The data used came from over 100 groups of tests made upon several engines, primarily for military information. The types of engines were the Liberty 12 and three models of the Hispano-Suiza. The tests were made in the altitude chamber, where conditions simulated altitudes up to about 30,000 feet, with engine speeds ranging from 1,200 to 2,200 r.p.m. The compression ratios of the different engines ranged from under 5 to 1 to over 8 to 1. The data taken on the tests were exceptionally complete, including variations of pressure and temperature, besides the brake and friction torques, rates of fuel and air consumption, the jacket and exhaust heat losses.

With the Liberty engine operating at from 500 to 2,000 r.p.m., and with the Hispano-Suiza 300 horse-power operating from 1,400 to 2,200 r.p.m., it is found that the friction torque increases approximately as a linear function of engine speed at a given air density, and approximately as a linear function of density at a constant speed. This means that the friction horse-power increases approximately as the square of the speed. Actually the relation of torque and speed is such that the friction horse-power increases with speed raised to a power between the first and second, this power increasing with speed, and approaching the square. The relation depends upon the engine design, the speed, and density of the air. Any statements as to the distribution of the friction losses are based upon incomplete evidence; the indications are, however, that the pumping losses are about half of the total friction.

There is no doubt that for a given process of combustion and at a constant speed the engine power is directly proportional to the weight of charge supplied; in other words, proportional to the charge density at the beginning of compression. As a consequence, if operating conditions are sensibly constant except for altitude, the engine power will be closely proportional to the air density. The volumetric efficiency increases with increase of air temperature at constant pressure, so that power does not decrease as fast as the air density when the temperature is raised, due to changes in vaporisation and heat transfer.

A copy of Report No. 108 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.



**FRENCH COMMERCIAL AIRCRAFT AT CROYDON.—Two views of one of the Messageries Aérienne's Bréguets at the London Terminal Aerodrome. The machine is of the type known as the type 14.T. It is equipped with the Renault 300-h.p. engine, and carries four passengers within the cabin**

**Like the majority of recent machines of this make duralumin is largely used in the construction, the fuselage framing, the undercarriage, and the interplane struts being of this material.**

**The arrangement of fuel tanks is curious and peculiar to this make of machine. The main tanks are of streamline form, circular in section, and are carried one on each side below the upper wing, by short struts which pass from the front and rear spars to the crossing point of the lift and landing wires below. This can plainly be seen in the lower photograph.**

**The undercarriage is also somewhat unusual. In place of the usual V there are three struts per side, the rear two forming a V. From the base of this V to the base of the front strut passes a kind of rudimentary skid, to which the axle is attached. This type can also be fitted with a seaplane undercarriage, a single central float replacing the land carriage, and wing tip floats being attached at the position here occupied by the wing tip skids.**

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## FROM THE PARTICULAR TO THE GENERAL.

The making of a dictionary, particularly a bi-lingual dictionary, must be an arduous task. A dictionary of the technical and semi-technical terms referring to an art, trade or hobby which has developed a widely used brand of slang, such as is current in motoring and aviation circles, presents almost inconceivable possibilities for the perpetration of appalling infelicities of phrasing.

In compiling a French-English dictionary of motoring terms Mr. Leonard Henslowe has shown much courage and not a little resource, but one must fear that, for anyone who does not possess a sufficient knowledge of technical French phraseology to grasp the specific limitations of some of the translations which this work contains, it is likely at times to lead to serious misunderstandings.

The trouble arises from the fact that many technical terms in both languages have meanings which differ widely according to the context wherewith they are used.

Mr. Henslowe's dictionary suffers severely from this fact, particularly as there is no indication given as to the particular sense to be given to certain very non-committal phrases, and in many cases the French phrases given have far from obvious meanings.

One has, for instance, "Clip" translated "Collier de serrage"—a perfectly good translation for the clip part of a hose-clip, but scarcely a general equivalent for the unqualified English word. "Compound winding," which indicates that an electric motor or generator is fitted with both shunt and series windings on its field magnets, is given a French equivalent, "Excitation." "Excitation" means excitation, and merely refers to the fact that the field-magnets of such a machine are excited, and are therefore not permanent. Loosely the term is applied to any winding which serves the purpose of excitation, but it in no sense implies that the excitation is of the specific type known as compound.

When one is discussing the output of an electrical generator the "Intensity" of the current derived therefrom may correctly be rendered "Debit en Ampères." And he who objects to the dazzling head-lights of fellow road-users because of their "Debit en ampères" may only be regarded as an interfering philanthropist. But one can conceive of serious confusion arising from a casual reference to "the output in amperes of one's emotions."

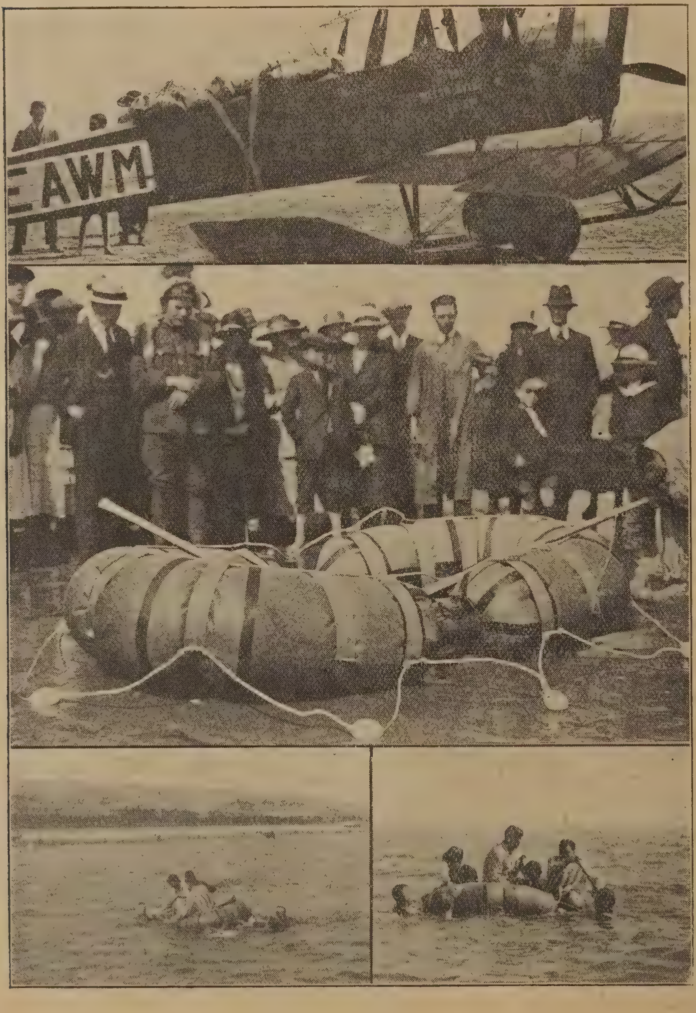
A sketch to scale may be a "lay out" in one sense, but "croquis a l'échelle" will scarcely help the tourist who wishes to threaten to "lay out" an over acquisitive petrol brigand.

"En etoile" as an equivalent for "radial" when discussing engines of that type is excellent; but it is certainly no more accurately equivalent to that word than is starshape in English.

There are numerous other cases of particular and specialised translations of a type likely to mislead the unwary, and one has to conclude that the author knows no more of the intricacies of French technical terminology than the average British motorist knows of English technical terms.

The book may be useful to those who are capable of using it with discretion, but if their knowledge of French suffices to permit such discretion, they can probably manage without it.

(Henslowe's Motor Dictionary. Compiled by Leonard Henslowe. French-English and English-French. London. Constable and Co., Ltd. Price 4s. 6d. net.)



**AN AEROPLANE LIFE RAFT.**—The photographs here reproduced represent the tests carried out on June 2nd on the Austin Life-float, which has already been described in these pages.

At the top is seen the raft packed on the Welsh Aviation Co.'s Avro. It must be recollected that the actual raft in the tests carried five persons seated, four held on to the life-lines, so that it is obviously a much larger affair than need be carried on so small a machine.

Mr. Austin has designed a raft to support four or five persons which will only weigh 10 or 12 lbs.

In the centre the float is seen on the beach after having been paddled ashore. This photograph shows clearly the form of the air-bags, the compressed air bottles, the life-lines, and the paddles provided.

In the two lower pictures the raft is seen afloat with the volunteer crew of members of the Swansea Swimming Club. It can be seen that one passenger—a lady—is lying at full length across the raft, and that there is then ample room for a number of others to sit inside. Both pictures show by the height of the air-bags above water-line that the buoyancy given is greatly in excess of that required for bare flotation.

It will be noted that the three last pictures were taken after the raft, complete with paddles, had been dropped into the sea from the Avro at a height of 100 ft. This does not by any means represent the normal treatment of such an appliance, but proves that the float in the present form will survive very rough treatment without damage.

The raft was fully inflated in about 30 seconds, after the arrival of the crew, and thanks to the form and the life-lines no difficulty was found in boarding it when inflated.

It is understood that Mr. Austin proposes to put in hand a much smaller, more compact, and lighter version of this float, intended for the use of two-seater machines, but capable of supporting quite a large number in case of need.

# NOTES FROM ABROAD.

## SOUTH AFRICA.

### A New Fuel.

According to the South African journals, a new petrol substitute, known as Penrol, invented by a Mr. Penhale, and produced entirely from South African products, has been tested on an aero engine by Captain Ross of the Ross-Thompson Aviation Co. Ltd.

The tests were made at Baragwanath Aerodrome, 5,700 ft. above sea level, and the machine used was a 110-h.p. Le Rhône "Avro." It is stated that the engine started easily, kept remarkably cool, and developed ample power.

Penrol is reported to be an alcohol-acetylene combination.

## FRANCE.

### A New French Concern.

The following is a translation of a note taken from one of the French newspapers :—

FRENCH AVIATION CONSORTIUM.—The object of this limited company is the study of trade and industry concerning aviation, automobiles, and mechanics in general.

The office is in Paris, 2, Rue Galilée. The capital of 120,000 francs will be subscribed, all in cash, by shares of 1,000 francs each.

The first directors are : Mr. Louis Blériot, manufacturer at Suresne (Seine), 3, Quai du General Gallieni; Mr. René Caudron, manufacturer, at Issy-les-Moulineaux (Seine), 52, Rue Guynemer; the Société des Aéroplanes Morane Saulnier, at Puteaux (Seine), 3, Rue Volta; the Société des Ateliers d'Aviation Louis Bréguet, at Paris, 115, Rue de la Pompe; the Société des Automobiles Hispano-Suiza, at Bois-Colombes (Seine), Rue du Capitaine Guynemer; the Société des Etablissements Nieuport, at Issy-les-Moulineaux (Seine), Boulevard Gallieni, 46; the Société Henri et Maurice Farman, at Billancourt (Seine), 167, Rue de Silly; the Société Lorraine des Anciens Etablissements de Dietrich et Cie. de Luneville, at Paris, 125, Avenue des Champs Elysées; the Société des Moteurs Gnôme and Rhône, Paris, 41, Rue de la Boétie.—J. S.

## JAPAN.

An exhibition of German war aircraft was given to journalists and others interested at the Japanese Army Aerodrome at Tokorozawa on April 21st. Twenty-four types, all of the latest period of the war, were shown, together with some twenty specimens of German engines.

It is reported that the Mosubishi Dockyard Co. Ltd. has bought a tract of land near the Army aerodrome at Kagamigahara, and intend to establish aircraft works thereon. The Kawasaki Dockyard Co. Ltd. of Kobe are also proposing to establish an aeroplane factory in the same neighbourhood.

Mr. C. Itoh, of the Itoh Aeroplane Works and Flying School, Mr. C. Nakajima, of the Japan Aeroplane Works Co., Mr. E. Shirato, of the Shiratoh Flying School, and Mr. C. Inagaki, engineer to the Itoh Aeroplane Works, have each been awarded sums of from yen 3,000 to yen 2,000, given by the Flight Bureau, in recognition of their services in the development of aviation in Japan.—N. K.

# TRADE NOTES.

### Aluminium.

"Aluminium : Facts and Figures," is the title of a little pocket-book issued by the British Aluminium Co. Ltd. of 109, Queen Victoria Street, E.C. It contains an enormous amount of information as to the properties and qualities of this extremely useful metal, together with a large amount of information as to the casting and working thereof.

Sizes, weights, strengths, and the electrical qualities of aluminium in sheet, rod, bar, and tube are given in great detail, and all those who have to deal in aluminium should find the work of considerable value.

The pocket-book is in loose leaf form and a fair amount of space is left for added notes.

Copies, price 5s., may be obtained from the company at the address given above.

### For Those Due East.

All readers of this paper who are interested in motoring, as presumably about 90 per cent. are, will find some very pleasant reading in a booklet just issued by the Sunbeam Motor Car Limited, of Wolverhampton, entitled "On the Open Road in India." This booklet describes tours in the Punjab and Kashmir with a 16-h.p. Sunbeam, and gives, both descriptively and photographically, an excellent idea of the pleasures and difficulties of motoring in India. The best part of the book is a description of a trip from Rawalpindi to Srinagar, the capital of Kashmir, in the course of which the road climbs to 7,500 feet through scenery which makes Switzerland look merely silly.

So many officers and men of the R.A.F. are either under orders for India or are likely to be ordered to India at any moment that the appearance of this little book is singularly opportune at the moment, and one strongly recommends any Service people who are interested in India to write for a copy of the book, which will be sent free on application by the Publicity Department, Sunbeam Mtotor Car Limited, Moorfield Works, Wolverhampton. One can assure one's readers that the book is far more than a mere advertisement for the Sunbeam car. It contains in fact one of the most fascinating descriptions of motoring that one has met, and the illustrations give a most vivid idea of life in Northern and North-Western India, which is just where the R.A.F. chiefly have to operate.

### Back Number Wanted.

Can any reader supply a copy of THE AEROPLANE of Wednesday, July 26th, 1916? One is required to form part of a collection of records relating to the work of one of the early pioneers of British Aviation. Please address : J. B. W., c/o THE AEROPLANE, 175, Piccadilly, W.

### New Company.

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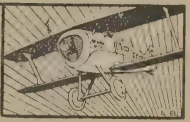
# COMMERCIAL AERONAUTICS AND CIVIL AERIAL TRANSPORT.



## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Company. B.C.—Bristol Aeroplane Company. B.M.—Brompton Motor Company. C.A.—Dept. of Civil Aviation. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Petters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aeriens (S.N.E.T.A.).

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

#### JUNE 6th:

K.L., Fokker, H-NABI, London-A'dam, 10.05-16.33, G.M., 1, Duke.
M.A., Breguet, F-CMAC, London-Paris, 10.24-13.27, G., 2, Donelin.
I.L., Bat, G-EAPK, London-Paris, 12.33-15.30, Nil, 4, Chattaway.
S.N., DH4, O-BARI, London Brussels, 12.40-15.48, G.M., 1, Van Opstal.
I.L., DH18, G-EARO, London-Paris, 12.35-15.15, G.M., 6, Powell.
M.A., Breguet, F-CMAQ, London-Paris, 16.02-18.40, Nil, Nil, Portal.
I.L., DH4, G-EAMU, Paris-London, 09.55-12.12, G.M., 2, Robins.
H.P., HP, G-EATN, Paris-London, 11.20-14.27, G., 10, McIntosh & 1.
G.E., Goliath, F-GEAC, Paris-Ldn, 12.45-15.10, G.M., 12, Labouchere & 1
H.P., HP, G-EATK, Paris-London, 13.15-16.21, Nil, 10, Rogers & 1.
K.L. Fokker, H-NABQ, A'dam-London, 14.03-16.40, G.M., 3, Hofstra.
M.A., Breguet, F-CMAK, Paris-London, 15.00-17.20, G., Nil, Perignon.
M.A., Breguet, F-CMAD, Paris-London, 16.40-19.00, Nil, 3, Paille.
M.A., Spad, F-ACMH, Paris-London, —18.30, G.M., 4, Rauge.
A.D., DH9a, G-EAXC, Brussels-London, 18.30-20.05, Nil, Nil, Piercey.

#### JUNE 7th:

D.H., DH9, G-EAVK, London-Bailleul, 08.25—, Nil 2, Cobham.
K.L., Fokker, H-NABQ, London-A'dam, 10.00-14.18, G.M., 1, Hofstra.
M.A., Spad, G-ACMF, London-Paris, 10.21-13.15, G., 1, Briere.
M.A., Breguet, F-CMAK, London-Paris, 10.30-13.35, G., 2, Perignon.
G.E., Goliath, F-GEAC, London-Paris, 12.58-16.05, G., 5, Labouchere & 1
H.P., HP, G-EATM, London-Paris, 14.21-17.35, G.M., 9, McIntosh & 1.
M.A., Breguet, F-CMAD, London-Paris, 15.30-18.15, G., Nil, Paille.
M.A., Spad, F-ACMH, London-Paris, 15.56-18.29, Nil, 1, Rauge.
A.D., DH4, G-EAXD, London-Brussels, 16.25-18.46, Nil, Nil, Piercey.
M.A., Breguet, F-CMAM, Paris-London, 09.40-12.03, G.M., 3, Delage.
S.N., DH4, O-BARI, Brussels-London, 12.16-14.15, G.M., 2, Van Opstal.
G.E., Goliath, F-FHMU, Paris-London, 12.33-14.50, G., 7, Favreau & 1.
I.L., DH18, G-EARO, Paris-London, 13.18-15.35, G., 8, Chattaway.
M.A., Breguet, F-CMAB, Paris-London, 13.40-16.05, G.M., Nil, Delily.
M.A., Breguet, F-CMAC, Paris-London, 13.55-16.13, Nil, 4, Challoux.
K.L., Fokker, H-NABI, A'dam-London, 14.18-16.40, G.M., 1, Olley.
M.A., Breguet, F-CMAQ, Paris-London, 16.25-18.51, M., 3, Donelin.
D.H., DH9, G-EAVK, Bailleul-London, —18.00, Nil, 2, Cobham.

#### JUNE 8th:

K.L., Fokker, H-NABI, London-A'dam, 10.10-14.00, G.M., Nil, Olley.
M.A., Breguet, F-CMAM, London-Paris, 10.10-12.32, G., 2, Delage.
I.L., Vimy, G-EASI, London-Paris, 12.26-15.10, G.M., 10, Powell.
G.E., Goliath, F-FHMU, London-Paris, 12.40—, G., 5, Favreau & 1.
S.N., DH4, O-BARI, London-Brussels, 12.45-14.48, G.M., 1, Van Opstal.
I.L., DH18, G-EAWO, London-Paris, 14.47-17.00, Nil, 2, Barnard.
M.A., Breguet, F-CMAQ, London-Paris, 16.30-18.45, Nil, 3, Donelin.
M.A., Breguet, F-CMAB, London-Paris, 16.41-18.53, Nil, Nil, Delily.
M.A., Breguet, F-CMAL, Paris-London, 09.55-12.40, G.M., 3, Portal.
S.N., DH9, O-BATA, Brussels-London, 11.59-15.15, G.M., 2, Sahnovsky.
G.E., Goliath, F-GEAI, Paris-London, 12.55-15.57, G., 6, Labouchere & 1.
M.A., Breguet, F-CMAK, Paris-London, 13.40-16.40, G.M., Nil, Revenue.
A.D., Martinsyde, G-EAXB, B'sels-London, 13.50-16.00, Nil, Nil, Piercey.
K.L., Fokker, H-NABM, A'dam-London, 14.23-18.33, G.M., 2, Duke.
M.A., Spad, F-ACMA, Paris-London, 17.30-20.25, G.M., 3, Perignon.

#### JUNE 9th:

M.A., Breguet, F-CMAC, London-Paris, 10.05-12.12, G., Nil, Challoux.
K.L., Fokker, H-NABM, London-A'dam, 10.15-15.05, G.M., 1, Duke.
S.N., DH9, O-BATA, London-Brussels, 12.58-15.26, G.M., 2, Sahnovsky.
G.E., Goliath, F-GEAI, Ldn-Paris, 14.15-16.25, G.M., 11, Labouchere & 1
H.P., DH4, G-EAWH, London-Paris, 15.29-17.35, G., Nil, Rogers.
M.A., Breguet, F-CMAK, London-Paris, 16.10-18.40, G., 2, Raven.
A.D., DH4, G-EAXF, London-Brussels, 16.20-18.10, Nil, Nil, Piercey.
I.L., DH18, G-EAWO, Paris-London, 09.28-12.10, Nil, 2, Barnard.
I.L., Vimy, G-EASI, Paris-London, 11.20-14.17, G.M., 5, Powell.
S.N., DH4, O-BARI, Brussels-London, 11.51-14.39, G.M., 2, Van Opstal
M.A., Spad, F-ACMI, Paris-London, 12.40-15.31, G.M., Nil, Rauge.
K.L., Fokker, H-NABQ, A'dam-London, 14.15-17.11, G.M., Nil, Hofstra.
G.E., Goliath, F-GEAC, Paris-London, 16.10-19.38, G., Nil, Bechler & 1.
M.A., Spad, F-ACMH, Paris-London, 16.15-18.50, M., 3, Charpentier.

#### JUNE 10th:

K.L., Fokker, H-NABQ, London-A'dam, 09.56-13.45, G.M., Nil, Hofstra.
M.A., Breguet, F-CMAL, London-Paris, 10.48-12.50, G., 1, Portal.
I.L., Vimy, G-EASI, London-Paris, 12.35-14.50, G., 10, Robins.
I.L., DH18, G-EARO, London-Paris, 12.53-14.55, M., 6, Powell.
S.N., DH4, O-BARI, London-Brussels, 13.48-15.47, G.M., 2, Van Opstal.
G.E., Goliath, F-GEAC, London-Paris, 13.50-17.05, G., 8, Bechler & 1.
M.A., Spad, F-ACMH, London-Paris, 14.10-17.00, Nil, Nil, Charpentier.
M.A., Breguet, F-CMAM, London-Paris, 17.05-19.15, Nil, 3, Donelin.
M.A., Breguet, F-CMAM, Paris-London, 09.40-13.00, G.M., 3, Donelin.
H.P., DH4, G-EAWH, Paris-London, 11.05-13.46, Nil, 2, Rogers.
H.P., HP, G-EATK, Paris-London, 11.10-15.17, G., 9, Perry & 1.
M.A., Salmson, F-CMAN, Paris-London, 12.40-16.17, G.M., Nil, Delage.
G.E., Goliath, F-GEAI, Paris-London, 13.00-16.50, G., 12, Favreau & 1.
K.L., Fokker, H-NABM, A'dam-London, 14.47-18.25, G.M., 3, Olley.
M.A., Breguet, F-CMAQ, Paris-London, 16.15-19.30, M., 3, Paille.

#### JUNE 11th:

K.L., Fokker, H-NABM, London-A'dam, 09.58-15.07, G.M., 1, Holmes.
M.A., Breguet, F-OMAQ, London-Paris, 10.00-12.35, G., 3, Paille.
M.A., Salmson, F-CMAN, London-Paris, 17.15-19.25, G., 1, Delage.
G.E., Goliath, F-GEAI, London-Paris, 12.55-15.30, G.M., 13, Favreau & 1.
H.P., DH4, G-EAWH, London-Paris, 17.42-19.35, Nil, 2, Rogers.
S.N., DH9, O-BATA, London-Brussels, 18.22-20..28, G., 2, Sahnovsky.
I.L., Vimy, G-EASI, Paris-London, 11.25-14.47, G., 9, Robins.
M.A., Breguet, F-CMAC, Paris-London, 11.45-14.40, G.M., 4, Briere.
S.N., DH9, O-BATA, Brussels-London, 11.57-15.15, G.M., 2, Sahnovsky.
M.A., Spad, F-CMAY, Paris-London, 12.40-17.25, M., Nil, Revenue.
G.E., Goliath, F-GEAC, Paris-London, 12.50-16.25, G., 6, Bechler & 1.
M.A., Breguet, F-CMAL, Paris-London, 16.15-19.10, G.M., 1, Portal.
K.L., Fokker, H-NABM, A'dam-London, 16.28-20.00, G.M., 1, Duke.

#### JUNE 12th:

M.A., Breguet, F-CMAC, London-Paris, 12.36-15.00, Nil, 1, Briere.
M.A., Breguet, F-CMAL, London-Paris, 12.41-14.58, G., 2, Portal.
M.A., Breguet, F-CMAM, London-Paris, 12.56-15.25, Nil, 4, Perignon.
M.A., Spad, F-CMAY, London-Paris, 13.11-15.15, G., Nil, Revenue.
G.E., Goliath, F-GEAB, London-Paris, 15.00-17.50, G., Nil, Gaston & 1.
M.A., DH18, G-EARO, Paris-London, 11.15-14.00, Nil, 7, Powell.
H.P., DH4, G-EAWH, Paris-London, 18.00-20.25, Nil, 2, Rogers.

### Inland Flying at Croydon.

June 6th.—H.P., DH4, test (Perry); I.L., Vimy Hendon return (Barnard).

June 7th.—I.L., DH18, test (Barnard); S.F. Avro joyrides (Muir); D.H. DH9 Stag Lane return (Cobham).

June 8th.—I.L., Vimy test (Robins); I.L., DH18 test (Barnard); H.P. HP to Cricklewood (Rogers); S.F., Avro joyrides (Muir).

June 9th.—H.P., HP to Cricklewood (Perry); I.L., DH18 test (Robins); S.F. Avro joy-rides (Muir); B.A.C. Avro from Dunstable (Robinson).

June 10th.—I.L Vimy tests (Powell); S.F. Avro to Cambridge (Ortweiler) Avro joy-rides (Muir)

June 11th.—S.F. Avro joyrides (Muir); B.A.C. Avro to Hertford (Robinson); G.E. Goliath from Ashford (Gaston).

June 12th.—M.A., Breguet, test (Perignon); S.F. joyrides (Muir).

### Air Port Statistics.

CONTINENTAL.

Machines, 97; Passengers, 299; Crews, 111; Total Personnel, 410

This does not include an occasional H.P. which started from Cricklewood.

Corresponding week, 1920:—

Machines, 93, Passengers, 188; Crews, 107; Total Personnel 295

### The London Terminal Aerodrome.

Capt. the Hon. F. E. Guest, M.P., Secretary of State for Air, accompanied bv Major-General Sir Frederick Sykes, Controller-General of Civil Aviation, and Brig.-General Francis Festing, Controller of Aerodrome Licences, all visited the Aerodrome on Saturday, June 4th.

All three descended in state each from a separate and several R.A.F. Staff Saloon. Fortunately they were not observed by the *Daily Mail*, who was at that time in the Trust House.

On Wednesday last week Sir Frederick and Lady Sykes flew to Paris in D.H.18 G-EAWO, piloted by Mr. Barnard, and returned the following day.

Mr. Piercy, of the Disposal Co., arrived from Brussels on Monday of last week on a D.H.9a in 1 hour 35 mins. He flew this machine with considerable success in a race at Brussels. The following Wednesday he arrived again from Brussels (whether he had returned to Brussels in the meantime is doubtful, but all the evidence goes to prove that he did, on Tuesday, in a D.H.4) this time in a rather moth-eaten looking Martinsyde, the engine of which was knocking as though it were a single cylinder motor-cycle being driven by oneself.

Mr. Piercy had apparently lent the machine to a Belgian pilot, who had evidently seen Mr. Courtney's landing in the Aerial Derby last year and had concluded that that was the correct way to land a "Tinsyde" of any breve or quaver. So he went and did likewise. The fact that the machine was in sufficient condition to fly back says much for its construction, and Mr. Piercy's able management of affairs and machines generally.

The previous day Mr. Cobham on a D.H.9 belonging to the

**Viscount Leverhulme emerging from the Instone D.H.18 "City of Cardiff" (Napier engine) at Croydon on returning from Paris. Mr. Game, of the I.A.L., is seen on the extreme left, and Mr. Colman, of the C.A.T.O. Staff, is on the right.**

De Havilland Aircraft Company, flew with Colonel Guinness, M.P., and a well-known General Officer, to Bailleul for a War Memorial ceremony. He landed on the old No. 1 Squadron aerodrome, which he found had been under the plough. The "9," however, easily got the better of the surface both in landing and taking off.

Before returning they flew up and down the Ypres section of the old front line, reaching Croydon in the evening at 18.00.

Mr. Cobham says that he had a most interesting time on Derby Day taking photographs of the traffic. These, in his opinion, will alone be sufficient to enable arrangements to be made whereby everyone will be able to travel to Epsom at a pace well above the legal limit, should they be so nefarious as to wish to do so.

The mooring-mast is not yet complete, though the contract date, one believes, was June 10th. However, by Sunday evening there was about 80 ft. of mast showing. One does not contemplate with equanimity the job of climbing up the whole 120 feet of it.

For those who are interested in Archaics, there is a most interesting old early type steam-engine on exhibition. Mr. Brenard informs one that it is Stephenson's "Rocket," but other experts state that it is of even earlier date, and was used in connection with Watts' earlier experiments with steam. This apparatus will be used for winding the airship into the mooring mast! It seems equally probable that any self-respecting airship will summarily wind this hoary specimen of mechanism up the mast before the aforesaid specimen of mechanism has a chance to get a pull in edgeways.

On Friday an Avro belonging to the Berkshire Aviation Co. arrived with Messrs. Holmes, Taylor, Robinson and Wilfred as passengers. Wilfred is an enormous and ferocious mouse-hound about one foot long. He is now the mascot of this sporting firm, and flies with them wherever they go.

During the last week they have been at Dunstable. During the war there was an R.E. Signal Depot there, and consequently there is no money now in Dunstable, so the B.A.C. decided to stay the night at Croydon rather than the aforesaid Dunstable.

The B.A.C. seem to be great upholders of the Alfred Dunhill school of nicotine artists. They are by no means alone in this respect, at any rate, at Croydon, neither does Croydon lag far behind them in the matter of weapons used, yet it must be readily admitted that it would be very difficult to reach the standard in pipes now set up by Mr. J. D. V. Holmes, which has a pronounced negative dihedral.

In the afternoon this cheery quartet (not forgetting Wilfred) started off for Hertford, in which town they are being billed. They will doubtless help the quondam Chief of the R.N.A.S. in his election, which is now being fought, to see whether Mr. Bolmondeley can induce the Hertfordians to accept Commodore Sueter *vice* Pemberton-Billing retired. One would hate to be run by Mr. Bolmondeley as one of his crew of disgruntled ex-Service M.Ps. Look out for another powerful article next week!

One day last week a D.H.9 ambled round to the petrol pump to be filled. In the ordinary course of events there would have been nothing strange in this, but for the fact that on the side was painted the name of "Aircraft Transport and Travel Ltd." This was the last of that firm's D.H.9s., and it has been bought by K.L.M. and was on the way to Holland.

One learns that arrangements are now approved by both the Air Ministry and the R.Ae.C. for housing the six machines of the latter at Croydon. One understands that the machines will shortly arrive.

### The Instone Air Line.

The Instone Air Line are now running a daily service in each direction. Machines will leave Croydon at 10.30 hrs. and leave Paris at 16.00 hrs. It is presumed that the other British service will run twice daily, also leaving Paris at 10.30 hrs. and Croydon at 16.00 hrs., but, of course, one has no information from them about this.

Mr. Robins was flying the "Vimy" on Wednesday to "get it on his licence," and the following day he renewed acquaintance with the D.H.18, of which type he was a pilot during the regime of A.T. & T. He also took the "Vimy" to Paris on Friday, and returned on Saturday, each time fully loaded with goods and passengers.

On Friday Mr. Powell was testing the "Vimy," and later in the day he took the D.H.18 (RO) to Paris, returning on the following day.

Mr. Chattaway took the "Bat" earlier in the week, and Mr. Barnard took the new "18" on Wednesday, returning earlier the next day.

### The Surrey Flying Services.

Mr. Muir was flying in connection with a fête at Norwood on Wednesday. Passengers were delivered at the aerodrome in one of Basil Foster's cars, and after Mr. Muir had aviated them over the fête were returned whole to the fête.

Earlier in the day Mr. Muir, with oneself, flew over the fête to have a look at it. It was held on a big recreation ground, in which there would have been ample room for a forced landing. Mr. Muir is arranging to continue this excellent form of propaganda at further local fêtes.

Mr. Ortweiler took G-EAWJ to Cambridge on Friday, where he is giving joy-rides during May Week to "other men's sisters," on behalf of the C.U.Ae.S. He intended to use the machine for one day only, but owing to the huge demand for flights he wired to Mr. Muir to know if he could keep the machine over the week end, which he did.

### The Flying Dutchmen.

The K.L.M. are still going very strong with goods and passengers, especially on the trip to Holland. The way the Fokker gets off with a full load is really exceptionally good considering the low horse-power.

Mr. Charles Dickson has done some really excellent water-colours of the Fokker for Mr. Leverton, who is exhibiting these as posters. Mr. Dickson did some splendid paintings for the Instone Air Line last year, the advertising value of which would have been enormous, but unfortunately this was during the dark days of that line, and they were not accepted.

### Handley Page Transport.

After giving various vivid demonstrations of the "taking-off" movement on O/400 at Croydon, Mr. Cogni has decided that in future it will be best to hide the light of "taking-off" under a bushel—the bushel being Cricklewood. There they can waste the sweetness of these manœuvres on the Cricklewood air—unseen like "full many a flower."

The pilot of high-speed horses, Mr. Donoghue, went to Paris in the D.H.4a, where he rode a not-at-all-fast horse in the French Derby. He returned in the evening.—G. D.

## AT THE AERODROME PETROL PUMP.

If you can wait your turn when all about you
Are pushing in and wasting all your time;
If you will work yourself to get the petrol
Knowing that it will *cover* you with grime.
If you can wait and not be tired of waiting,
Or when you get impatient—hold your tongue.
Or being sworn at, don't give way to swearing,
But when you miss your turn keep bravely mum.

If you can wait, and still wait on for ever,
And yet remember petrol is your aim.
If you can watch as others fill before you
But smile—and go on waiting just the same.
If you can see each money-laden minute
Slip empty by—and still restrain a "damn";
You will deserve the pump and all that's in it,
But—what is more—you'll be a gentleman.

—J. M. Q.

## FLYING AND SPORT.

One is informed by a spectator who was present at Lords on Saturday that aircraft really made a positive nuisance of themselves. In fact, it seems that Mr. Donald Knight lost his wicket in the first innings when a machine was flying low across the bowling screen opposite him. It is quite likely that this machine sufficiently distracted the batsman's attention to make him mistime the ball, as he evidently did.

Doubtless these machines were taking photographs which appeared in the Sunday Press.

Flying over a ball game in which "eye" is so important is most disconcerting, as is to have a machine in one's field of vision at all, and it is to be hoped that aeroplane firms will in future do the sporting thing and refuse to take photographs over test matches.

The Wimbledon Lawn Tennis week starts almost at once, and it is to be sincerely hoped that aircraft will not there disgrace themselves and flying in general as they have on previous occasions.

One feels sure that it is only a matter of pointing this out to these firms who probably do not realise how much more a machine interferes with cricket and tennis than it does with football and similar pastimes in which there is no harm done by an occasional photographic reconnaissance.—G. D.

## THE AMAZING MR. HINKLER.

The following letter has arrived, as the AEROPLANE is going to press, from Mr. Claude Perrins, of A. V. Roe and Co. Ltd., at Hamble :—

"You know that the Aero Club of Australia had decided to honour Bert Hinkler and themselves by entertaining him to dinner at the Hotel Australia, Sydney. Imagine Bert at Brisbane on the morning thereof, the weather anything but kind, and the knowledge of two disappointments and the accompanying postponements spurring him on. Again, the need for prompt progress to enable him to catch his boat for England in time for the Aerial Derby.

"What a position to be in. Knowing Hinkler as we do one thoroughly sympathises with him, and admires the spirited and gloriously splendid effort he made to beat time and storm—and all the more appreciates the tremendous loneliness and pain of loss that he felt when penning his letter from—

"'Somewhere away in the bush not far from the beach, about 15 miles north from Newcastle.—Thursday, 28th April, 1921.'

"He goes on to write :—

"'What about it now? You will be thinking what a pceuliar address. Well, the circumstances are so strange that I had better get on with the story

"'My—our—(he is writing to his wife—poor Baby rests upside down on the beach. I had a great day yesterday, and that is how the end of a perfect day found us. It was thus :—I left Brisbane yesterday morning to fly to Sydney at 6 a.m. The weather was anything but encouraging, and I had special reasons for pushing off. The Aero Club was giving me a dinner at the Hotel Australia, and as I had postponed it twice previously I felt I could not play with them any longer. So at Brisbane I had a look round the 'bus and engine, and all was O.K. for an early start.

"'The inconvenience of accommodation necessitated my sitting up overnight at the so-called aerodrome so as to be off at daybreak. When the first streak of dawn appeared, it was heralded by heavy clouds and rain, so I delayed starting awhile. The pressing engagement at the other end would not let me rest, so I let her go at 6.15 a.m., and I had not been up in the air half an hour when I found rain. I managed to dodge some of the storms—some I had to plough right through—Gee—I thought I was "out for six" several times. Anyhow I managed to keep pushing on, and after about 8 hours of it with my "prop" in such a condition as you may guess—as trying to go to bits—just nearing Newcastle, only about 70 miles from Sydney, the rain came down in full fury, absolutely walloping down—cats and dogs. I had been beaten down to the level of the beach, my wheels almost skimming the waves, so that I had to ring my bell!

"'Luckily there was a good stretch of beach, and even though the storm was raging at its hardest I found the beach all right, and made quite a decent landing. When I got out I turned her round to the best position, and stood hanging on for about an hour. By this time you may guess I was getting damp—I was miles from anywhere, and it had gone 3 p.m., so during a lull I ran to the top of one of the sand hills to see what form of civilisation existed around me, and oh! my luck, nothing but dense scrub as far as the eye could see.

"'I remembered passing over a house or two some miles back, but I could not leave the 'bus just now. Judge my feelings when—before I could get back from my vantage point—my—our—poor old Baby was caught by a gust, and over she went flat on her back. If it had not been for the horror of it all I should have admired the graceful turn over, and now I am down and out. When the climax occurred, fortunately, she was just out of reach by the tide. I could do nothing more, I simply sat down, and—as there was not another soul for miles—had a good howl. I felt the most wretched being on earth. What a pal she has been to me.

"'When I regained commonsense, and as I could do no more for the 'bus I began to walk along—dreary trail it was. I went back along the beach for about four miles, then started inland through the bush. I shall never forget that slogging trudge through the dense undergrowth, everything soaking wet. I forget how many miles I must have done—I was at it so long that I was nearly going to give up for a while—I should have done so, but I was afraid that if I did I should become cold and stiffen up, so that in the morning I should be useless. Anyhow, to cut a long story short, after some hours just as it was getting dark I spotted a house. It really gave me new life, and I was almost normal again. Further disappointment—the place was empty. Anyhow, I found tracks leading to civilisation, and following one of them eventually found people, and the rest was easy.

"'One good thing, the Baby is not much hurt, so she ought soon to be put right and out again.

"'The engine was going beautifully—never gave the slightest anxiety whatever.

"'I am waiting for some men and horses to pull the bus the 16 miles along the beach to Newcastle where I hope to put her on the train for Sydney.

"'Well, they've arrived, and now I must be off.

"'Will be with you soon. I am personally feeling fit.

'BERT HINKLER.'

"Having known the 'bus, and better still, the tender care Bert gave ungrudgingly to her, one shares his grief. What a fine chap he is! It is gathered from the Australian Press that he was sailing on May 5th, and we were all wondering whether he would arrive in time.

"Now, as I write—a knock, and there enters Mr. and Mrs. Hinkler. What a chap for surprises! Sailed May 5th, Sydney to New Zealand, thence to Fiji Islands, a peep at Honolulu, boat to Vancouver, then across Canada by rail to Toronto—a look at Niagara—then New York for two hours, then aboard the *Olympic*, reaching Southampton and home Saturday evening, June 11th, 1921.

"Now we all hope he will pilot the Avro Baby to victory in the Aerial Derby."

## THE ROYAL AIR FORCE MEMORIAL FUND.

A meeting of the Executive Committee of the above Fund was held at the offices, No. 7, Iddesleigh House, Caxton Street, S.W.1, on the 2nd inst., Lord Hugh Cecil in the Chair. The members of the Committee present were Lady Leighton, Dame Helen Gwynne-Vaughan, Mrs. Barrington-Kennett, Air Vice-Marshal Sir John Salmond, Sir Charles McLeod, Air Commodore H. R. M. Brooke-Popham, H. E. Perrin, Esq.

A list of subscriptions received since the last meeting on May 12th, 1921, amounting to £408 12s. 9d., together with a list of Grants made since the same date amounting to £44 16s. 8d., were submitted, and the latter item was approved.

A Grant in aid of the initial expenses of the R.A.F. Pageant, to be held at Hendon, on Saturday, July 2nd, was authorised.

The Hon. Treasurer submitted a detailed statement of the general financial situation of the Fund.

The R.A.F. Memorial was fully discussed, Sir Aston Webb being again in attendance to offer his advice. A special meeting to deal with this subject may be called at any time at the discretion of the Chairman.

The Boys' Home at Vanbrugh Castle it is hoped will be opened in the early part of August next, and arrangements to that end are being rapidly carried out.

The next ordinary meeting of the Executive Committee was fixed for Wednesday, June 29th, at 3 p.m., at the offices of the Fund.

# INDEX TO ADVERTISERS

| | |
|---|---|
| Accles & Pollock, Ltd. | 556 |
| Aircraft Disposal Co., Ltd., The | 553 |
| Armstrong Siddeley Motors, Ltd. | 546 |
| Arrol-Johnston, Ltd. | Front Cover |
| Auster, Ltd. | Front Cover |
| Bristol Aeroplane Co., Ltd. | 546 |
| Cellon, Ltd. | Front Cover |
| Cunard Line | 560 |
| De Havilland Aircraft Co., Ltd., The | 553 |
| Fairey Aviation Co., Ltd., The | 545 |
| Hancock, James Lyne, Ltd. | 560 |
| New Pegamoid, Ltd. | 560 |
| Nieuport and General Aircraft Ltd. Co., | Back Cover |
| Roe, A. V., & Co., Ltd. | Inside Front Cover |
| Rudge-Whitworth | 556 |
| "Shell" Marketing Co. | 551 |
| Short Bros., Ltd. | Back Cover |
| Titanine, Ltd. | Front Cover & Inside Back Cover |
| Westland Aircraft Works | 549 |

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# ON THE INDEPENDENT FORCE DINNER.

On June 20th there took place at the Hotel Cecil (late the Bolo House) the Annual Dinner of the Independent Force, R.A.F., an event which is always thoroughly enjoyable and at the same time remarkably impressive: enjoyable because of the meeting of so many old friends, and impressive by reason of the important personages who attend, of the demonstration of devotion which the officers of the Independent Force always show to their great chief, and of the annual announcement of past progress and future policy which Sir Hugh Trenchard is accustomed to make.

On this, the third, occasion His Royal Highness the Duke of York, K.G., who was unavoidably absent last year, honoured the assembly with his presence, and Captain Guest, Secretary of State for Air, was the chief of those invited.

After the usual loyal toasts, to the second of which the Duke of York replied in a graceful little speech saying that as a member of the Independent Force he intended always to be present at this dinner, Sir Hugh Trenchard proposed the toast of the Independent Force, R.A.F. The Air Marshal impressed on those present that he wanted all who had served in the Independent Force to come to future dinners. At present the famous 8th Brigade was the mainstay of these meetings, and he wanted more and more in future.

## The First Independent Air Service.

Turning then to the main subject of his discourse, Sir Hugh recalled that the Independent Force, R.A.F., was the first effort to form an independent air force, a matter which was still subject to considerable opposition. The duty of the R.A.F. was to carry the Independent Air Force to its logical conclusion so that it might soon become the equal of the older of the King's Services, and ultimately become the premier Service. The R.A.F., he said, needed at present the co-operation of the senior Services as it was still not able to stand alone.

Since last year the R.A.F. had made noteworthy progress. He had visited a number of stations, though not as many as he would have liked, and all showed remarkable improvement. Sport was going well at all of them, and the spirit and tone had improved out of all knowledge. The R.A.F. had beaten the Army at Rugby. Polo of high class was played at Halton. They had a man and a horse in the Grand National. The Force had made a very good showing in the Inter-Service boxing championships. A number of R.A.F. cricket and tennis teams were doing well. Sports were of the greatest importance to the Force.

The boys who were learning to become mechanics at Halton would enhance the fame of the R.A.F., when they came to man's estate. This year the first batch of officers from the Cadet College at Cranwell had come into the R.A.F., and had proved themselves to be quite up to the required standard.

During the recent industrial crisis, the R.A.F. Reserves came up to a man. Hundreds of officers had offered their services, and though only a few could be accepted he was very grateful to all the others, and a letter of thanks had been sent to each of them.

Outside England the R.A.F. was also doing well. In Ireland, where he hoped all the troubles would soon be ended, the R.A.F. had been a great help to the Army. In India the R.A.F. was winning a name for itself worthy of the Senior Services, and No. 1 Squadron at Bangalore had won the Polo Handicap.

In Egypt, where he had been recently, every squadron was like a squadron of the old Independent Force. Mr. Churchill had while in Egypt given orders that the desert route to India was to be opened, and the R.A.F. was doing it.

At the Conference held in Egypt on the Middle East problems the air occupied as big a part as any other question.

Air Power was the greatest factor in preventing war. A tribesman plotting a raid on a British post and hearing an aeroplane overhead was apt to remember the fate of similarly covetous friends who had met the R.A.F. while on similar missions, and he would certainly think better of it. Aircraft were a powerful agent to compel submission if given time. People were sometimes surprised that a troublesome tribe did not come in a few days after the R.A.F. had started work, but when one asked how long a punitive expedition had been in that tribes' country one was told that it had been there four months and still had not stopped the war.

R.A.F. results might not be achieved quicker than by the older Services, but they were undoubtedly cheaper in life and money, and he hoped that such would always be the order in which this country would calculate the cost of war.

Nothing revolutionised war and the will to win was what decided a war. The next great war would be a war of nations in which the whole civilian population would be concerned, and Air Power could make or break the will to win and might prevent a war.

Speaking on personal matters, Sir Hugh regretted the absence of General de Castelnau, who had done so much by his cordial co-operation to make the success of the Independent Force possible. He also regretted the absence of Maurice Baring, who was in Egypt and still very ill.

Mr. Churchill has asked him to say how sorry he was to sever his connection with the air, but that he would never lose interest in air affairs. On this occasion they had for the first time their own undivided Secretary of State as chief visitor. Sir Hugh ended by thanking Major "Toc" Smith for his good work in organising the dinner.

## Reminiscences of the War.

Major-General Dickie, C.B., C.M.G., who had come back to the Army as a Colonel after retiring before the war, and had been C.R.E. to the Independent Force, told interesting little tales of making the Independent Force's aerodromes, and laying down forty-three underground petrol tanks of seven tons weight apiece, which tanks that amusing institution the Disposal Board wanted to dig up and bring back to England for sale. General Dickie appealed to the High Authorities of the R.A.F. to see that the little cemetery of the Independent Force at Charmes was maintained in proper order.

Colonel Sir W. R. Lawrence, Bart, G.C.I.E., G.C.V.O., C.B., proposing the toast of Sir Hugh Trenchard, said that no praise was too high for the efficiency and gallantry of the Independent Force. They were the only men of all Haig's multitudes who carried war into the enemy's country. [A word might have been spared for their predecessors of the R.N.A.S. at Luxeuil under "Daddy" Elder, who after all did bomb German towns early in 1917.—C. G. G.]

Continuing, Colonel Lawrence said that there might be a slump in things military, but while Sir Hugh Trenchard was with them there would always be a Boom in the Air Service—a self-evident statement which was received with acclamation.

Then becoming serious he told how some four years ago there came a crisis in Sir Hugh's career. He, Colonel Lawrence, suggested a compromise which Sir Hugh promptly turned down because he did not consider it to be for the good of the Air Service, adding, "I've not to think of my own soul."

Col. Lawrence said that he had worked with some big men in his time, but that none were like Sir Hugh. Concluding, he said that these gatherings had a certain domestic nature. Last year Sir Hugh's engagement was announced, this year they had to congratulate him on the arrival of a son and heir. Being an optimist he hoped at some future dinner to congratulate him on the arrival of a grandson.

After the usual interval necessary for the officers of the Independent Force to express their sentiments the Air Marshal made a speech of the kind which he really likes making least. He said simply, "Your Royal Highness and Gentlemen, I thank you."

Group Captain C. L. N. Newall, C.M.G., C.B.E., A.M., before proposing the health of the Secretary of State, congratulated the Independent Force on the fact that ten per cent. of the officers were present that night. He also asked those present to join the I.F. Dinner Club, and to get others to do so. He then proposed the health of Captain Guest, the

DO NOT FORGET THE R.A.F. PAGEANT ON JULY 2nd.

first Secretary of State for Air, to attend an Independent Force Dinner.

### Captain Guest on Economy.

Captain Guest replied in a neat speech, saying how much he felt the value of the personality and assistance of the Duke of York to the Independent Force. Times to-day were hard, but not so hard as when those present flew into Germany, so he had no fear of their losing heart. The psychology of the times must be understood. It was necessary to view Britain's present position in proper perspective. The wonder was that the old country was pulling through.

Speaking of economising, he said that it was always difficult to contract quite suddenly. The problem was to maintain the heart of the old R.A.F. Economy would produce a proper sense of the value of money. [Let us hope this will apply to some of Mr. Lloyd George's more grandiose and less necessary schemes.—C. G. G.]

The prejudice of other vested interests would be overcome by patience. Our short-sightedness in air affairs was only our national conservatism. The Air Service could afford to be tolerant. "How can they understand?" he quoted, referring presumably to the aforesaid "vested interests," which, he remarked, had a horizon of only eleven miles, being always on the ground or at sea level.

Thereafter the assembled diners retired to a large anteroom where they talked old times till the exigencies of early-closing train services compelled the majority to go home. One hopes that an even bigger party will assemble next year, when trade and trains are more normal, and those from the country can afford both time and money to attend.—C. G. G.

### Among those present.

Those present included:—

Air Marshal Sir H. M. Trenchard, Bart., K.C.B., D.S.O., A.D.C., Chief of the Air Staff.

Capt. The Rt. Hon. F. Guest, C.B.E., D.S.O., M.P., Secretary of State for Air.

Wing Commander, H.R.H. The Duke of York, K.G., G.C.V.O.

Maj.-Gen. J. E. Dickie, C.B., C.M.G.

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* * *

## REAR-ADMIRAL SUETER, M.P.

Many people will regret and some will be glad that Rear-Admiral Murray Sueter, C.B., has entered Parliament as Member for East Herts *vice* Mr. Pemberton Billing retired. There is some satisfaction in having a man of Admiral Sueter's honesty, imagination and intelligence in the House of Commons, but if he had to go into Parliament one would rather have seen him enter as a Coalition coupon-candidate —which is at worst merely dull and respectable—than as the nominee of Mr. Bottomley. Despite his imagination in naval and aerial matters Admiral Sueter has evidently failed to comprehend that while Mr. Bottomley's personality and methods may appeal to a certain fraction of the populace they are not as approved by the class to which Admiral Sueter belongs by right of birth and service; and people are apt to think that birds of a feather flock together, or at any rate that a man is known by the company he keeps.

It is a pity that Admiral Sueter should thus depart from his traditions, for the Navy owes him much and Naval Aviation owes him more. He was the first officer of his rank to devote himself to submarines, and his book on submarines is still a standard work. He was the senior officer in charge of the construction of the first British rigid airship, a vessel which in 1909 embodied features of design which only appeared in practise in the later German Zeppelins. He was the first Director of the Air Department at the Admiralty, and while there upheld the policy of variety of design and encouragement of the Aircraft Industry against the War Office policy of standardised design and domination by the Royal Aircraft Factory. He encouraged the experiments in torpedo-dropping seaplanes instituted by the late Lieut. Hyde Thompson, R.N. (later Lieut. Col R.A.F.), and took out joint patents with that officer in 1912 for this type of weapon which has just been discovered by the press as a new American invention.

At the Admiralty he was liked by all who served under him, and his failure to go further than he did in the R.N.A.S. was due more to his kindness of heart than anything else, in that he did not dismiss inefficient people who ultimately let him down when he became the object of an intrigue of which the infamous treatment of the late Colonel John Porte (Commander, R.N.), by the law officers of the Crown was only a part. Though perhaps it is no great compliment one can safely say that Admiral Sueter was by far the most intelligent and most valuable R.N.A.S. officer who had risen above the rank of Commander in the Navy on his own seniority.

One can only hope that the grievance which he has against the Higher Authorities of the Admiralty and Air Ministry will not result in his becoming merely a captious and disgruntled critic of those Departments, but that he may again show the foresight and judgment which in earlier days helped him to build up the Submarine and Air Services of the King's Navy, the two branches of the Senior Service which did most to win the war.—C. G. G.

## THE UNDER SECRETARY FOR AIR.

The Marquess of Londonderry, on accepting office in the Government of North Ireland, has resigned the post of Under Secretary of State for Air. His excellent judgment, tact, and honesty will be a great loss to the Air Ministry, where he had won the highest regard.

## MORE H.P. WING EXPERIMENTS.

Observers at Cricklewood report that some interesting flying has been done there of late by Mr. Frank Courtney on the Handley Page monoplane which has been facetiously nicknamed the "Rhinopteros" or "Money-wing," a name which may be taken as indicating that much wealth will be made out of this invention in future, or may be merely an allusion to its "penny-in-the-slot" design.

The machine itself is apparently a standard D.H.9a fuselage with a Liberty engine, and with a cantilever wing built on top of it, the said wing having a slotted leading edge. There does not appear to be any provision for pulling down flaps *à la Fairey* along the trailing edge, and thus opening a second slot behind the rear spar.

For lack of this the machine amounts merely to an experiment with a single Handley Page slot on a cantilever wing, and in fact goes little or no further than did the experiment with the D.H.9 (Puma engined) biplane flown by Mr. Hope and Major Foote last year. Thus it seems that progress is disappointingly slow, seeing that in the direction of slotted and flapped wings lies the key to the success of commercial flying.

Still, slow as is the progress of developing the H.P. wing it was evident that the "Rhinopteros" is an advance on the biplane. Absence of flaps and of the second slot probably accounted for the necessity for flying the machine with the tail down in a position which would be very unpopular in a passenger-carrying machine, and also probably accounts for what looked like a lack of lateral and longitudinal control at the big angles which give this type of wing such immense advantages in getting off the ground and in landing. There was, however, no doubt about the slow forward movement in each case, which means the ability to start from and alight in a small aerodrome.

One assumes that it was lack of such control which ultimately resulted in the machine alighting with so little forward movement that its undercarriage collapsed and terminated the experiments somewhat abruptly. Nevertheless it seemed that enough was proved to indicate that with a little further development aeroplanes designed on these lines will do for all practical purposes just about what the helicopter enthusiasts are trying to get their machines to do, and will do it long before any helicopter becomes a practical flying machine.

It is earnestly to be hoped that money will be spent in such quantities on further constructional and experimental work as to produce practical commercial aeroplanes with wings of this type in good time for next year's air line work. Also it is well to note that the qualities of this wing are equally valuable for the work of the R.A.F., particularly in connection with deck-flying machines, amphibians, seaplanes, and bombing machines in which it is desirable to lift a heavy load in a short distance. The Air Ministry can help the progress of aviation by encouraging these experiments even more than it can by subsidising air lines.—C. G. G.

## THE "SEARCHLIGHT" TATTOO AT ALDERSHOT.

Three illuminated Bristol Fighters took part in a "searchlight" tattoo in aid of military charities, on Farnborough Common, on the nights of June 15th, 16th, and 17th.

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Diseñadores y constructores del tipo Fairey III. Serie de aparatos suminstrados en cantidad al Gobierno Británico, durante la guerra *y después de su terminación.* En esta serie de aparatos, el fuselage, el plano central y la unidad de la cola, son standard y fabricados para adaptarse á diferentes tipos de alas, chassis y motores de otros aparatos de series que sean adecuadas para ejecutar los fines particulares para los cuales se requiera el empleo del aparato. Todas las máquinas de este tipo, tienen alas plegadizas y eatán provistas del dispositivo patentado de combeo variable Fairey que da una alta performance y potencia de ascensión combinada con una velocidad baja de aterrisaje.

# SPORT IN THE R.A.F.

## Eastchurch Sports.

The sports of the Armament and Gunnery School, R.A.F., Eastchurch, took place on the 15th, by kind permission of Wing Commander A. Wellesley Bigsworth, C.M.G., D.S.O., A.F.C. Considering the small number of personnel at present on the strength of the unit, the meeting was in every respect an unqualified success. The band from the R.A.F. Station, Isle of Grain (by kind permission of Wing Comdr. H. R. Busteed, O.B.E., A.F.C.), was in attendance.

Group-Capt. H.C.T. Dowding, C.M.G., O.C. No. 1 Group, together with many other officers and friends from several other units, were present.

The following is a list of the principal events and results:

100 Yds. Flt Race.—1st, FS Richmond; 2nd, FO Abbott; 3rd, AC2 Ferguson.

Potatoe Race.—Ist, LAC Pike; 2nd, FS Tilley; 3rd, AC2 Sykes.

Pillow Fight on Spar.—1st, AC2 Morgan; 2nd, AC2 Willers; 3rd, FS Tilley.

440 Yds. Flat Race.—1st, FS Richmond; 2nd FO Abbott; 3rd LAC Pike.

100 Yds. Flat Race (open to D.W.B.).—1st, Mr. Hobbs; 2nd, Mr. Hutchinson; 3rd, Mr. Taylor.

High Jump.—1st, AC2 Hughes (4 ft. 10½ in.); 2nd FS Richmond; 3rd FO Abbott.

Tilting the Bucket.—1st. Flt. Lieut. Lumley (M.O.) and AC2 Morgan; 2nd, WO1 Loveland and FS Tilley.

One Mile Flat Race.—1st AC1 Mounter; 2nd AC2 Sykes; 3rd, AC2 McLeod.

100 Yds. (open to Navy, Army, Air Force and Discharged Soldiers and Sailors).—1st, Mr. Hobbs (D.W.B.); 2nd, Mr. Hutchinson (D.W.B.) 3rd, AB Thompson (R.N.).

Long Jump.—1st. FS Richmond (18 ft. 10 in); 2nd, AC1 Willers (16 ft. 9 in.); 3rd, LAC Pike (16 ft. 4 in.).

120 Yds. Hurdles.—1st. FS Richmond; 2nd FO Abbott and WO1 Parker (dead heat).

Obstacle Race.—1st, FO Hesketh; 2nd LAC Pike; 3rd, FS Tilley.

Putting the Shot (16lb.).—1st, WO1 Parker; 2nd, FO Abbott; 3rd, FO Hesketh.

3 Miles Flat Race.—1st, AC2 Prestney; 2nd, AC1 Mounter; 3rd, AC2 Sykes.

100 Yds. (open to Serjeants).—1st, FS Palmer; 2nd, FS Rembridge; 3rd, FS Jenkins.

Tug-of-War.—1st, "A" Flight; 2nd, "B" Flight; 3rd, H.Q. Flight.

Various other events for the ladies and children also took place, as also a Band Race, greatly to the amusement of the spectators.

The prizes were presented by Mrs. Wellesley Bigsworth. A handsome cup, presented by the C.O., was also handed to Flt. Serjt. Richmond, for having secured the highest number of points. Flt. Serjt. Richmond obtained 14 points, the second being F.O. Abbott with 8½. A special prize was also awarded to Flt. Serjt. Williams for the very fine show he put up in the 3 mile race. Although a veteran of 41 years, with over 20 years' Service, he finished a good 4th, in a very hard-fought race.

A hearty vote of thanks proposed by F.O. Abbott to Mrs. Wellesley Bigsworth, brought a very successful meeting to a close.

## No. 2 Squadron Sports.

No. 2 Squadron sports were held on June 15th, at the Aerodrome, Fermoy. As the C.O., Sqd. Ldr. A. J. Butler, remarked, the Committee are to be congratulated on the excellence of their arrangements.

The sports were nicely divided into Individual and Flight Events, "B" Flight easily winning the right to hold for a year a very beautiful Flight Cup presented by the Officers.

A.C.2 Bradford of "B" Flight, with 12 points, secured the Gold Medal of the Best Individual Athlete, presented by the Sports Officer.

The following was the complete programme:—

220 Yds. Inter-Flight Relay Race.—Won by "C" Flight. Team: FO MacKay, Cpl. Mascroft, AC Sutcliffe, AC Minkley. Second: "B" Flight.

880 Yds. Inter-Flight Relay Race.—Won by "B" Flight. Team: Cpl. Mills, AC2 O'Driscoll, AC2 Bradford, AC2 Simpson. Second: "C" Flight.

1 Mile.—AC2 Mulvany (B Flt.). 120 Yds. Hurdles.—FO James (B Flt.). 100 Yds.—FO James (B Flt.). Long Jump.—AC2 Stuart (H.Q. Flt.) 3 Miles.—AC2 Deacon (C Flt.). Pillow Fighting.—AC1 Thorpe (A Flt.).

Officers 100 Yds. Race.—FO MacBain (B Flt.). 440 Yds.—AC2 Bradford (B Flt.). Long Service Race.—Serjt.-Maj Brady (A Flt.). High Jump.—AC1 Skeoch (A Flt.). 880 Yds. —AC1 Dunn (A Flt.). Putting the Shot.—FO MacBain (B Flt.). Three-Legged Race.—AC1 Skeoch and AC2 Keeble (A Flt.).

440 Yds. (open to 16th Infantry Brigade).—Cpl. Cornwell ("The Buffs"). Tilting the Bucket.—AC1 Mason (C Flt.). Obstacle Race.—Flt. Lt. Russell (C Flt.). Inter-Flight Tug-of-War.—H.Q. Flight.

Everyone helped vey much, and the band of the Buffs was very greatly appreciated, and as a result of a conspiracy with the Sports Officer performed the R.A.F.'s own March Past in great style.

Group Capt. J. M. Bonham-Carter, O.B.E., who arrived on a B.E.2c, presented the prizes. Amongst those who honoured us with their presence were Col.-Commandant N. V. Cameron, C.B., C.M.G., D.S.O., commanding 16th Infantry Brigade, Col. Bernard, 6th Divisional Hqs., Col. and Mrs. Mackenzie, Major and Mrs. Alexander, Col. and Miss Martelli, Col. and Mrs. Power, and many officers of the Garrison.

## Athletics at Henlow.

Inland Area Aircraft Depot Fourth Annual Athletic Sports were held on June 15th. A capital cinder running track has been made. There is a grand stand for the accomodation of several hundred spectators, and enclosures for Officers, Warrant Officers and Serjeants, Corporals, the Astra Athletic Club competitors, and the general public. The ground is completely enclosed by a high iron pallisade, and will be available for football and hockey fixtures during the winter season.

Actual work on the track and ground only began on April 4th, and, considering the dry weather, the track was in tip-top running order, and reflected the greatest credit on Serjt. Barber, who devoted endless energy to its construction. F.Os. Cole and Collins supervised the erection of the stand and enclosures.

Nearly all events were well contested. There was a great gathering of the general public, and the band from the Depot, Herts and Beds Regiment, played throughout the afternoon.

The Wise Challenge Cup (Inter-section) was won by the Engine Repair Section; Aeroplane Repair Section were runners-up. The Victor Ludorum Cup (presented by the N.A. and A.F.I.) went to A/C. Trapp, and the Commanding Officer's special prize for the most meritorious sportsman of the year was awarded to Serjt. Barber.

Mrs. Burdett kindly presented the prizes at the conclusion of the meeting.

The principal results were:—100 Yds.—AC Trapp, 10 4/5th sec. Hurdles.—AC Peters, 20 secs. Tug-o'-War.—A.R.S. High Jump.—AC Peters, 4 ft. 10 in. 220 Yds.—AC Trapp, 24 4/5th sec. 880 Yds.—AC Snaith, 2 min. 20 4/5th sec. 1 Mile.—AC Searle, 5 min. 8 3/5th sec. Long Jump.—AC Amos, 19 ft. 8 in. Shot.—AC Fairweather, 31 ft. 6 in. 440 Yds.—AC Down, 60 sec. 3 Miles.—AC White, 17 min 40 sec.

In the evening there was a dance attended by nearly 300 couples. The catering went without a hitch, due to the energy of Mrs. Holland and her assistants.

Next week Henlow has the Championships fixed for the 23rd and 24th, and the R.A.F. is busy making arrangements for approximately 500 competitors from different units.

### Cricket at Henlow.

On the 11th, the 1st Eleven Inland Area Aircraft Depot beat Old Warden—I.A.A.D., 113; Old Warden, 78. AC2 Abbott made 42 runs, and AC Tomkins took 3 wickets for 10.

On the same day, Stotfield beat I.A.A.D. 2nd Eleven. Stotfield, 58; I.A.A.D. 42. AC Weaver took 3 wickets for 9.

### Football at Henlow.

A General Meeting was held on the 13th instant, when officials, etc., for the forthcoming season were elected. It was decided to enter for the F.A. and Amateur Cups, the Bedfordshire County League, and Herts. County League, in addition to the other competitions.

### Personal Notes From Henlow.

Sqdn. Ldr. G. W. Williamson, O.B.E., M.C., went on leave on June 14th, pending embarkation for India. During his 14 months at Henlow he for a long time commanded E.R.S., and was President of the Services Institute, in which he took great interest.

Serjt. Wappet went to Uxbridge for discharge on the 16th. He has been Hon. Sec. to the Football Club, and did a very great deal for all forms of sport in the Depot.

## Manston's Prowess.

The School of Technical Training (Men), R.A.F., at Manston, after finishing up a most successful football season, in which they played 29 matches (not including friendly games) won 23, lost 4, and drew 2, scoring 112 goals against 23, and winning 3 Challenge Cups, have started exceptionally well in athletic sports this season.

A strong and well organised athletic team was sent by char-à-bancs to Kenley on Saturday, June 11th, to compete in No. 1 Group Athletic Sports Meeting, and came away with the Inter-Unit Athletic Cup, having won the following events:—100 yards, 220 yards, 440 yards, 1 mile relay race, 3 miles team race, 120 yards hurdles, high jump, putting the weight (16 lbs.), tug-of-war.

(*Continued on page 575.*)

DO NOT FORGET THE R.A.F. PAGEANT ON JULY 2nd.

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# MORE FACTS ABOUT RECENT "Bristol" PERFORMANCES.

## First in Belgium—

At the Spring Meeting of the Belgian Aero Club at Brussels, the first prize in the general test was awarded to Lieut. Stampe, the pilot of the King of the Belgians, flying the King's private aeroplane—a "Bristol" Tourer.

## Touring in France—

Mr. A. S. Butler, who has been touring the Riviera in his privately owned "Bristol" Tourer, arrived at Croydon after making the journey from Le Touquet to Waddon in 2 hrs. 11 mins. In addition to a passenger he carried about 350 lbs. of luggage and spare parts. "Mr. Butler," says "Flight," "has nothing but praise for the 'Bristol' machine."

## A "Bristol" in Spain—

Owing to a serious railway breakdown the renowned Spanish bull-fighter Fortuna was conveyed in a "Bristol" Tourer from Madrid to Algeciras, a distance of 300 miles over mountainous country, in record time in order to keep his engagements. This flight created a great impression in Spain.

## The "Bristol" Reputation—

These are merely summaries of recent "Bristol" exploits, for every week the "Bristol" machines are extending their world-wide reputation as really reliable and economical means of transport.

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## THE WEEKLY COMMENTARY.

The experiences of a passenger on R.36 on the recent Ascot traffic control trip are narrated below. The general impression received from this experience is that no other form of transport can be compared with the airship in the absence of discomfort. But the fear is expressed lest the Air Ministry, by carelessness in matters of detail which have nothing whatever to do with airships themselves, shall produce a bad impression on those who are given demonstration flights.

Airship travel is free from all traces of excitement and produces no marked impressions on the passenger, and the positive effect of minor discomforts due to thoughtlessness and carelessness are apt to be acutely felt by contrast with the uneventful nature of the actual journey.

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Judging from the appearance of the majority of modern buildings, and from certain wailings in the Press, one might conclude that architects, as a race, were extinct. The account which will be found in this issue of the work of certain architects in regard to the lay-out of aeronautical establishments proves that not only is the race not extinct, but that some at any rate possess foresight, enterprise, and an appreciation of the importance of aviation. It must be presumed that the business man exerts as repressive an influence on architecture as he does on aviation.

## ON TRAVELLING BY AIRSHIP.

On Tuesday, June 14th, by the courtesy of the Air Ministry, I was afforded the opportunity of sampling travel by airship. A rigid airship was to be used by certain police officials to obtain a bird's-eye view of the road traffic to Ascot, and as R.36 was available the Press were invited to send their representatives.

### AN EARLY START.

It was desired that the ship should be in the neighbourhood of Staines not later than 10.30 a.m., and the start from Pulham was fixed for 7.30 a.m. Breakfast was at 6.0 o'clock, and shortly after 7.0 the party of guests faced and conquered the ascent of the mooring mast. At 7.30 sharp the ship cast off, and it is noteworthy that nothing but the fact that the ground was receding rapidly announced the departure. Within a few minutes the ship was climbing and on her course.

The passenger-cabin of R.36 does not give a good view for navigational purposes, and the sun refused to provide a bearing, but from what one could identify of the country below a practically direct course was made for London. The first generally recognised landmark was probably the Alexandra Palace, followed closely by the White City—no longer white—the wilds of Ealing, Hounslow and the Staines reservoir, which latter was reached before 10 o'clock.

The morning was hazy, the wind was more or less on the beam most of the way, and the height about 2,000 ft. Four wing engines throttled were used during practically the whole trip.

### ON THE BEAT.

Arrived at the scene of her labours, the ship proceeded to circle round Staines, Egham, Virginia Water and Windsor till about 1 o'clock, when a trip was made to Croydon Aerodrome, where a parachute containing despatches for the newspapers was dropped. From Croydon the return to the regular beat was made via Penge, Catford, Lewisham, New Cross, to Bermondsey, then parallel to the river to Westminster, then north passing west of Regent Street, over Lords and the Zoo, to Hampstead.

### A STRANGE SIGHT.

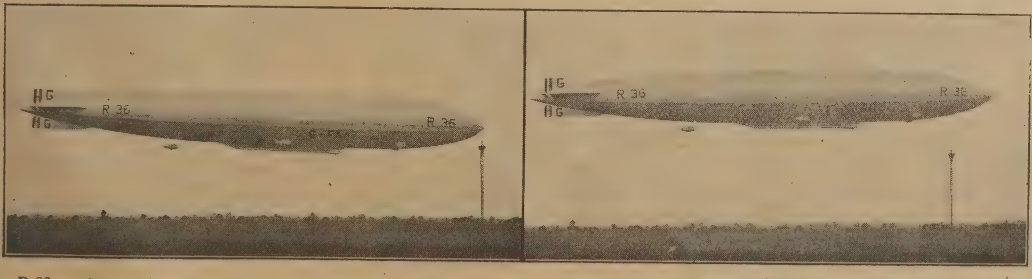
Somewhere in this neighbourhood a monoplane was sighted, flying apparently with its tail down at 20 degrees, and at a very low speed. It is assumed to have been the new H.P. monoplane, but its appearance was not particularly prepossessing.

Thereafter the ship returned Staines-ward, and continued to circle its beat till after 4 o'clock. The racing finished, a new beat passing directly over the course was covered two or three times, and for the first time traffic which really was congested became visible. A number of roads out of the course itself all concentrate on two main roads, and these were badly crowded. Actually it was possible to observe the traffic with great ease, and to see it as a whole and not piecemeal. Different types of cars and even their occupants were easily distinguishable.

Thereafter the Egham-Staines-Hounslow road was followed to the neighbourhood of East Bedford, and then Croydon was again made. Here more parachuting of "exclusive stories" was committed and, the hour being now sevenish, a northerly course was taken.

### HOMEWARD BOUND.

The route on the return journey took the ship across Croydon, Mitcham, Streatham, Balham, Clapham, Chelsea, Earls Court, Kensington Gardens, Paddington, Kilburn and Golders



R.36 casting off from the mast at the beginning of the Flight. On the left, just released. On the right, clear of the mast and under way.

Green, and thence due north to at least Welwyn. Thereafter the course was not certainly identified, but a certain amount of east entered into it at about this place, and at 9.30 Pulham was below.

Unfortunately the wind conditions at the terminal were unhappy, there being 90 degrees difference in direction between 400 ft. and the mast-head, and many intervening bumps. The captain was naturally anxious, with nearly 30 passengers on board, to have no untoward incidents, and some considerable time was taken in getting to moorings and disembarking the occupants. It was after 10.30 before the passengers were on the ground.

### THE SENSATIONS OF AIRSHIP TRAVEL.

As to the impressions received as to the sensations of airship travel, a certain number of preliminary and qualifying remarks are necessary. On the road, at sea, and in the air the writer has a liking for fresh air, and a view of the horizon. In R.36 one can with difficulty see any horizon, and 15 hours of regarding the earth beneath was, frankly, boring. This was accentuated by the fact that most of the journey was round the small circle of the regular beat which one soon got to know by heart.

Then, also, R.36 is not yet completely equipped—is without her heating and cooking system, and the final ventilation arrangements are not installed. Hence smoking was not permitted, a relief to the nerves but a strain on one's appetites.

### FOR THE ATTENTION OF THE AIR MINISTRY.

Very little notice was given to Pulham of the fact that a large number of passengers were to be carried on the trip, and apparently they were not advised as to how late the ship would be kept out by the police authorities. Under the circumstances Pulham is to be congratulated on having fed the passengers so excellently, but for so uneventful a day as one spent in an airship cabin food at frequent intervals is needed as a break in the monotony. One grows as hungry on an airship as on a ship at sea, and a cup of soup or tea and biscuits every little while will be found necessary in actual service. This is a matter for the Air Ministry, and it will be very unwise for them to take passengers for long trips without providing such comforts.

Another and more important matter for the attention of the Air Ministry is the provision of proper appliances for lifting passengers to and bringing them down from the mooring mast. If the Air Ministry desire to damn airships once and for all let them continue to make the climbing and the descent of a 120 ft. vertical ladder an essential to embarkation and debarkation. To a healthy and vigorous man—so long as he is not afflicted by the effect of giddiness at heights—the mooring-mast presents no terrors. But it is not a comfortable method of access, and for elderly men or those afflicted by physical weakness it is impossible, and it certainly is not suitable for lady passengers. All the representatives of the Press successfully scaled it, and all got down, but it is disclosing no secret to state that one or two of them intensely disliked the prospect of descending it in the dark.

It is understood that the Croydon mast is to be a distinct improvement in this regard, but it is simply ridiculous that passengers, particularly demonstration passengers, should be asked to climb 120 ft. of staircase even, when a lift might be installed at the cost of one or two day's running of an airship.

### A REVELATION.

Leaving these matters, which have nothing to do with airships as such, it has to be said that R.36, as a vehicle, is a revelation. Writing in a restaurant car on the Great Eastern Railway, one can compare the two only to the detriment of the railway. There is no perceptible motion on R.36—even low down on a bumpy day. It is extremely difficult to write legibly on the railway, so violent are the oscillations.

R.36 pitches, sometimes through a fairly big angle. On one occasion it pitched so far that glasses slid down the table. But it was the glasses sliding which drew one's atention to the fact, so slow and smooth was the motion.

This particular super-pitch occurred over the House of Commons, whence for some curious reason a large column of hot air was rising. Curious, because one believes that House was not at that moment in session.

By observing the earth it was possible to see that the ship rolled slightly, but here again one could not feel the movement.

As to noise honours are about easy. R.36 was not designed to carry a passenger-car, and the wing engines are abreast of the car now fitted. Even so, the noise is probably more noticed than that of the train, because it is less usual. It did not in the least interfere with speech. In a ship specially built for commercial purposes the wing cars could be removed to aft the cabin and the noise would vanish. With these two cars out of action there was no noise at all.

There are no draughts, and no traces of stuffiness on R.36. She was fresh, at times almost chilly, owing to the absence of any heater gear. A restaurant car is both draughty, smelly and overheated, even when not over-filled. There is plenty of room to walk about in the airship cabin, which is not true of the railway car.

R.36 has very comfortable bunks, and it is much easier to sleep on her than on any railway car, for even stoppages will not disturb one. Without looking out of the window one cannot feel, apart from engine noise, whether the ship is under way or not. Also, if one looks out of the window one does not get eyestrain from objects flashing past, and one gets no direct sun glare except just after sunrise and just before sunset.

### THE UNEVENTFULNESS OF AIRSHIP TRAVEL.

At the end of this particular trip everyone felt very tired, but nothing like so tired as after the same period in a train. Had one realised how uneventful the trip was to be, and provided reading matter, or a pack of cards, one would almost certainly have escaped this feeling.

It is simply impossible to conceive of anyone being sick from airship travelling. If any one is sick aboard an airship it will be from over-eating, and the Air Ministry did not afford an opportunity of testing this possibility.

There is no trace of thrill about travelling by airship; in fact, it is the most disappointingly uneventful experience which one has yet encountered. But for those who wish to travel from one place to another in perfect comfort and in perfect peace there is no vehicle to compare with it. A ship even in a calm is jerky and tremulous, and smelly in comparison with R.36—and R.36 is the first British experiment at providing passenger accommodation on a rigid. There is doubtless room for many improvements in detail in the present cabin, but even at this early stage it is safe to say that nobody who has the fortune to made a really long voyage in such a ship will ever willingly travel by steamer or train again.

But it is absolutely essential, before any serious attempt is made to demonstrate airship passenger transport to people who really matter that proper lifts and entrance gangways be provided at terminals, and that the ship should be amply provisioned.

It did not really take very long to get from Croydon to Pulham on this particular trip, but coming between tea at 4 p.m. and dinner at 11 p.m. it seemed an interminable journey. Given dinner on board, and less delay in getting the passengers down the mast, and the trip would have passed even more rapidly than did the outward one.

The Air Ministry has spoilt more than one ship for the sake of a ha'porth of tar, but it will be unforgivable if they wreck airships for the sake of a £500 lift and the salary of a competent caterer.—W. H. S.

## THE MAPELLI AND SCHNEIDER CUP COMPETITION.

In the notice recently published concerning the conditions of the Luigi Mapelli Challenge Cup for small aeroplanes, it was stated that the maximum engine capacity allowed in this year's engine competition was 455 centimetres. It was calculated that a highly efficient engine of this capacity might give from 8 to 12 horse-power. The Societa Anonima Imprese Aeree, Milano, which is organising the competition, writes to point out that in the copy of the conditions sent to THE AEROPLANE by them an error was made in the statement of the engine capacity, and that, in fact, the maximum engine capacity allowed is 4,585 cubic centimetres. Consequently the M.16 biplane, which won the Cup last year, piloted by Signor de Briganti, is again eligible this year.

It is very much to be regretted that no British firm is in a position to compete for the Mapelli Cup this year, but one hopes that by next year or the year after trade in general will so have improved that our aircraft firms will be able to afford to enter for foreign competitions.

*Apropos* foreign competitions, it is equally regrettable that no British machine has been entered for the Schneider Cup Competition, which again takes place in Italy this Autumn. Considering that British seaplanes are undoubtedly ahead of those of any other country, one would have thought that some effort might have been made to send a British representative for this important International contest. The absence of British machines is the more to be regretted seeing that the Royal Aero Club had definitely offered to allocate a considerable sum towards the expenses of any British competitors. In this case again it is to be hoped that in future years British seaplanes may be represented.—C. G. G.

## SAFETY AND ECONOMY.

The Committee appointed by the Royal Aeronautical Society to consider the questions of the design of engine, engine installation, etc., required for the safe and economical working of commercial aircraft have now completed and published their report.

This report is somewhat lengthy and is both interesting and important. It will be discussed at some length in the next issue of this paper.

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## THE SOCIETY OF ARCHITECTS AND AERONAUTICAL ARCHITECTURE.

It is of considerable interest to note that British architects are now considering seriously the problems of aeronautical architecture. Hitherto aeronautical buildings of all kinds, including the Air Ministry itself, have merely happened, that is to say they are merely buildings constructed to house certain people or certain products, and have never apparently been designed with any idea of beautifying the landscape.

It is only in Germany where airship sheds have been designed by real live architects with the result that some German airship sheds, at any rate, have the majesty of an Assyrian temple.

Now, however, the students of the atelier which is conducted so ably by Monsieur Chaurés on behalf of the Society of Architects at 28, Bedford Square, W.C.1, have for the first time taken aeronautical buildings as a subject of their study. Last week a private exhibition was held of the drawings produced for the monthly design competition of the atelier, the subject being the lay-out of a Centre of Scientific Research including aeroplane and airship sheds, workshops, laboratories, administrative offices and lecture halls for experimental and educational work in connection with aircraft.

Though one refers to the producers of these designs as students they are in fact the coming men of the architectural profession who band themselves together in the atelier for mutual assistance, criticism and competition. Monsieur Chaurés himself is the winner of the French Prix-de-Rome, and recently won a competition for the lay-out of the Paris fortifications, and the members include winners of the British Rome prize, the Society of Architects' "Victory Scholarship," the Tite prize, etc., and several big public competitions.

It is therefore eminently satisfactory that men of such quality should interest themselves in aeronautical architecture, for with the growth of civil aviation it will become necessary to design the buildings of air ports on an adequate scale. It is to be hoped that then such buildings may be designed by clever architects, and that the designing will be done not only with due regard to the elevations of the buildings, but also to beautifying their plan views, which in the circumstances will be even more important than their elevations.

Hitherto British seaports and British railway stations like our aerodromes have just happened, no attempt has been made to produce beauty in any of them. The architect will, however, have his chance in the future.

It seeems certain that this recent competition at the Atelier of the Society of Architects is, in fact, the first in which the circumstances of air travel have directed the intelligence of architects towards producing buildings of a general lay-out which shall be beautiful in plan as well as fulfilling mere requirements of usefulness for their purpose.

The Society of Architects did one the honour of asking one to criticise the designs which had been produced. So excellent were all the designs that one assumed that the producers had made quite a considerable study of the requirements of an aeronautical research centre, and it was with considerable surprise that one learnt that in fact none of the designers had any personal knowledge of aircraft, and that none of them had had time in which to study the subject. It was only possible, therefore, to congratulate the architects on both their intelligence and common sense.

All the lay-outs were distinctly good, though certainly some of them showed a very inadequate estimate of the actual size of a modern airship. One feels sure that the Superintendent of the Royal Aircraft Establishment at Farnborough would be delighted to exchange his present ramshackle wilderness for any one of these beautifully arranged aircraft parks, and that the Director of Research at the Air Ministry would be equally delighted to have such a park to visit when he is able to tear himself away from his office. One can only hope that the Director of Lands and Buildings at the Air Ministry may have the opportunity of seeing these designs and of comparing them with the amazingly ugly and frequently incompetent work which is done by the minor officials of his Department.—C. G. G.

## AEROPLANE STRUCTURAL CALCULATIONS.

"Flugzeugstatik," by Dipl.-Eng. Aloys van Gries. (Pp. 379, fig. 207. 80 mk. Springer, Berlin.)

The author states in the preface that he directed the section for structural calculations for some time at the Flugzeugmeisterei at Adlershof, and from this and from the excellence of the book it may be taken that its contents are really representative of German practice.

Mueller-Breslau's influence is patent here as in all German text-books on structural calculations, with the invaluable result of an agreed national system of terms and of symbols. The units are, of course, derived from the c.g.s. system.

A brief introductory chapter gives the outline of the aerodynamical basis of the external forces, and recapitulates the likewise agreed terms and symbols of German Aeronautics.

The first part of the book, to p. 183, lays out with characteristic order and thoroughness the application of standard methods to aeroplane structures, covering much the same ground as Booth, Berry, Bolas, Pippard, Cowley and Levy, Webb, Southwell, and others in this country.

On page 93 there is a perfunctory comparison with English writers, limited to Judge's 1916 volume, which admittedly did not incorporate the latest information then available, and to Cowley's and Levy's papers, which are dismissed with the not unjustifiable remark that earlier work on the subject is apparently unknown to (these?) English authors.

Part 2 proceeds to the discussion of individual parts, and collects a mass of information on relative dimensions and weights of different type parts and groups of parts, with analysis of the effect on flying performance of different proportioning of weights, and of different wing and body forms.

Part 3 goes into special cases and new types of construction, such as the cantilever without external wire bracing.

The diagrams and tabular calculations are admirably clear, and are a model to the practising designer.—A. R. I.

## THE ZEPPELIN AERODYNAMICAL LABORATORY.

At the Friedrichshafen works of the Zeppelin Company there has been installed an aerodynamical laboratory which includes among its equipment what is claimed to be the largest wind tunnel in the world.

The tunnel has been designed by and constructed under the supervision of Dr. M. Munk, who was for long associated with the Göttingen Laboratory, and it resembles the installation at Göttingen in many respects.

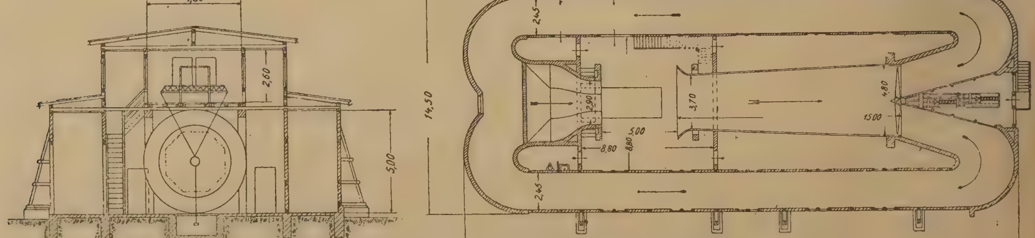
As in the majority of European installations, the tunnel is generally of the type used by M. Eiffel. That is to say, that instead of enclosing the model within a tunnel of parallel section as at the N.P.L., the models are in a large open room through which a parallel stream of air is passed.

The general arrangement of this tunnel is shown in the sketches here reproduced. The whole structure is built in concrete except for the exhaust cone, and constitutes a closed air system, the experimental chamber, inlet and exhaust cones, and the airscrew being on the centre line, with twin air return passages at each side.

The motive power of this installation consists of two 260-h.p. Maybach engines, coupled in tandem, driving through a reduction gear an airscrew 5 metres in diameter. The diameter of the airstream at the experimental chamber is 2.9 metres and the maximum air speed is 50 metres per second.

The whole of the measuring instruments are carried above the stream on a steel platform. An interesting feature of the balance used for measuring forces is that it is largely built up of duralumin girder work similar to that used on airship frames. Thus the weight of moving parts is kept down to the lowest possible limit.

Models are suspended by wires from two overhead bridges, one fixed permanently and the other movable, both horizontally and vertically. Movement of this bridge effects alterations in the incidence, etc., of the model.

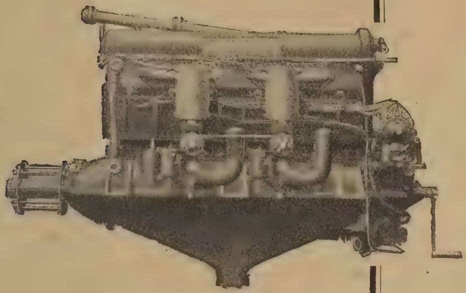


The Zeppelin Aerodynamic Laboratory at Friedrichshafen.

# NEW SUNBEAM-COATALEN — AIRCRAFT ENGINES —

## AT SPECIALLY REDUCED PRICES.

**An exceptional opportunity now occurs for the purchase of a strictly limited number of these well-known engines new from the works. These have been completed since the Armistice and have passed the British Government Aeronautical Inspection Directorate inspection tests at our Wolverhampton works, where they are now stored ready for immediate delivery,**

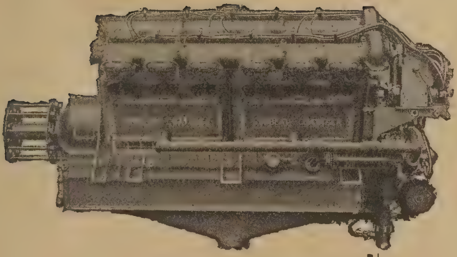


### 100 h.p. 6-Cylinder Vertical "DYAK."

This is the most reliable aero engine yet built, and was fitted to large numbers of small non-rigid airships for the British, Japanese and Norwegian Governments. It has also been successfully applied to Avro aeroplanes, motor cars and motor boats.

Price - **£295.**

(Current catalogue price for this type of engine, **£950.**)



### 300 h.p. 12-Cylinder "V" Type "MANITOU."

This engine is the logical development of the successful "MAORI" I, II, III, and IV, types of which many hundreds were fitted by the British and French Admiralties to seaplanes operating in the North Sea and Mediterranean. This engine has a very low power weight ratio, and is extremely reliable.

Price - **£395.**

(Current catalogue price for this type of engine, **£1,250.**)

*We shall be pleased to supply full specifications, installation diagrams and any other information on request.*

Examples of these engines may be seen at the following Depots and Agencies:

**LONDON SHOWROOMS** (as below).
**The Grosvenor Motor Co., Ltd., Eastgate St., CHESTER.**
**A. S. Weaver & Co., Central Garage, STOURBRIDGE.**
**Mann, Egerton & Co., Ltd., Prince of Wales Rd., NORWICH.**

**THE SUNBEAM MOTOR CAR Co., Ltd., Moorfield Works, WOLVERHAMPTON.**

*Telephone:* 985 Wolverhampton. *Telegrams:* "Moorfield, Wolverhampton."

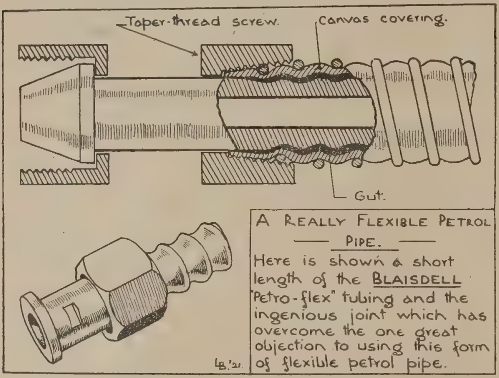
**London Showrooms and Export Department - - 12, PRINCES STREET, HANOVER SQUARE, W.1.**
**Manchester Showrooms - - - - - - - - - - - 106, DEANSGATE.**
**Southern Service & Repair Works - - - - 177, THE VALE, ACTON, LONDON, W.3.**

## FLEXIBLE PETROL PIPE AT LAST.

Though no doubt permanently fixed steel piping for petrol and oil systems in aircraft is preferable to copper piping, nevertheless rigid piping of any kind is liable to fracture by vibration or to damage by careless workmen, or by accident, when work is being done on other parts of the machine. Obviously flexible piping is preferable to any kind of rigid piping if a satisfactory flexible pipe which is petrol, oil, and waterproof can be had.

Hitherto the right kind of pipe has been lacking—at any rate since the Bowden flexible pipe was abandoned somewhere about 1905—or else, where a satisfactory pipe has been found it has been impossible to discover a trustworthy joint for it. All these difficulties seem to have been entirely overcome by the Blaisdell Petro-Flex Tubing Co., Ltd., of Cassiobury Works, St. Albans Road, Watford, Herts.

Mr. C. F. Abell, late R.N.A.S., who has been introducing this valuable invention to the Aircraft Industry, tells one that the piping and the new joint has been more than favourably received. Which is only what one would expect. Therefore as soon as the final tests have been made by, and official approval has been received from the Air Ministry we may expect to see this form of conveyor used very largely for all pipe-work on aircraft.



A Really Flexible Petrol Pipe.

Here is shown a short length of the Blaisdell "Petro-flex" tubing and the ingenious joint which has overcome the one great objection to using this form of flexible petrol pipe.

The form of joint used is shown very clearly in the attached drawing. The pipe itself is composed of an internal layer of gut—either pig, ox, or horse—strengthened by canvas and protected from external pressure by wire winding. Animal gut is found to be proof against petrol, oil and water, which is natural when one considers the nasty things animals eat and drink and what water does for one's boots. Canvas is the very best strengthening material, and wire is certainly the best anti-crush material.

Altogether there seem to be particularly bright prospects for the piping, which undoubtedly fills a long-felt want.

C. G. G.

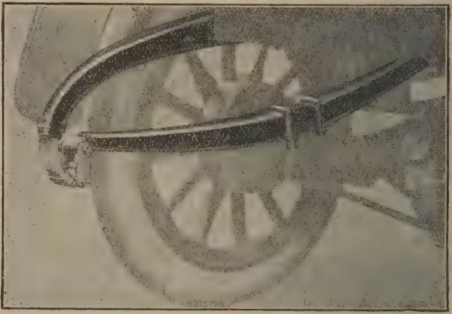
## SPORT AT VICKERS, LTD.

An illustration of the sporting spirit which exists among the office staff and works employees at Messrs. Vickers' Works at Brooklands is given by the fact that in a recent cricket match in the inter-department competition, played between the Drawing and Technical Office and the Tinsmiths' Shop, Mr. R. K. Pierson, the well-known designer, played for the former team, which just failed to win. As is well known Mr. P. Maxwell-Muller (Works Superintendent) and Mr. Knight (Works Manager) take a keen and active interest in all branches of sport and recreation among the workpeople. This naturally fosters a spirit of camaraderie and good-fellowship between heads of departments and their staffs which is reflected in the excellent workmanship for which the Brooklands works are noted, and also results in the maximum of quantity and quality of output, as was seen during the war.

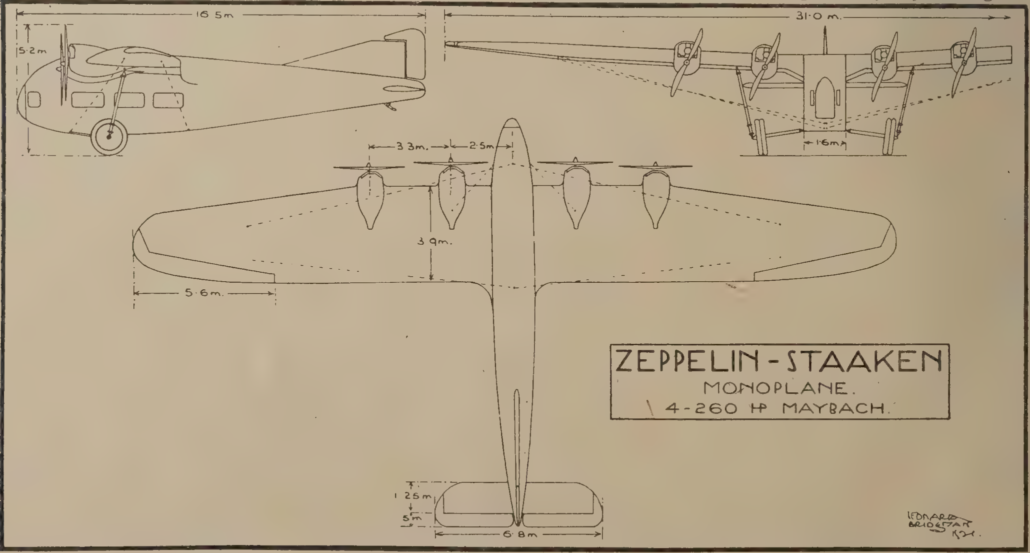
J. F. S.

## THE PRESERVATION OF SPRINGS.

Presumably all readers of this paper have either owned or driven cars at some time or another in their existence. To the owners, of course, particularly, one recommends a study of the usefulness of the "Duco" spring gaiter. This is just one of those simple things which prolong the life of a car and add to the comfort of motoring to a degree out of all proportion to their cost. The illustrations show the general idea of these gaiters. The gaiter is in fact a leather sheath which is laced onto the springs after the springs have been well greased. The interior of the gaiter is fitted with felt pads to prevent the grease from exuding unduly, and there is a groove along the gaiter which allows fresh supplies of grease to be injected from time to time. Obviously properly greased springs not only make the car more comfortable, but prolong the life of all the wearing parts.



Those who desire more information and particulars as to cost can obtain from Brown Brothers Ltd., Great Eastern Street, E.C. 2, a booklet which will give them all particulars, and also contains a measurement form, with the aid of which spring gaiters can be ordered for practically any existing car.



ZEPPELIN-STAAKEN
MONOPLANE.
4-260 HP MAYBACH.

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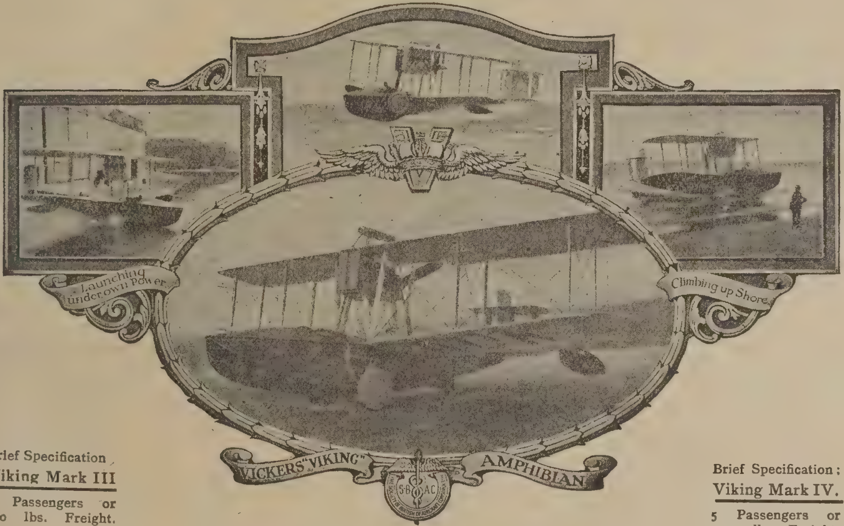
## LIMITED.

Telephone :
Victoria 6900.

Telegrams :
" Vickers, Vic, London."

Aeroplanes for Commercial and Military Use.
Flying Boats for Commercial and Naval Use.



Brief Specification
**Viking Mark III**

5 Passengers or
750 lbs. Freight.

RANGE : 480 miles.
SPAN : 46′ 0″
HEIGHT ; 15′ 1″
LENGTH ; 33′ 5″

The Vickers Viking was classified FIRST in the following competitions at the INTERNATIONAL SEAPLANE COMPETITIONS at ANTWERP, July, 1920

1. **Shortest time in "unsticking" from water.**
2. **Fastest time over a given circuit.**
3. **Climb to 1,000 metres.**
4. **Altitude with full load.**

Depots :

MANCHESTER : Cathedral House, Long Millgate (temporary address)
BIRMINGHAM ; Vickers House, Loveday Street.
NEWCASTLE : Commercial Union Buildings, Pilgrim Street.
GLASGOW ; Vickers House, 247, West George Street.
BRISTOL ; 55, Park Street.
NORWICH ; 16, White Lion Street.
BELFAST ; 26a, Arthur Street.
LEEDS : Greek Street Chambers, Park Row.

Brief Specification :
**Viking Mark IV.**

5 Passengers or
1,250 lbs. Freight.

RANGE : 480 miles.
SPAN : 50′ 0″
HEIGHT : 15′ 1″
LENGTH : 35′ 0″

The Vickers Viking was the winner of the FIRST prize of £10,000 for the Amphibian Class of Aircraft entered for the BRITISH AIR MINISTRY COMPETITION September, 1920

Aviation Department,
VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

DE HAVILLAND

Aeroplanes = Avions = Vliegtuigen = Aeroplanos.

The De Havilland Aircraft Co., Ltd., is in a unique position to undertake the design construction and complete equipment of aircraft for every kind of commercial, scientific and administrative purpose. Enquiries are cordially invited.

Le De Havilland Aircraft Co., Ltd., se trouve placée dans une position unique pour entreprendre la construction, avec équipment complet, des avions de tous genres, destinés à des services commerciaux, scientifiques ou administratifs. Toutes demandes de renseignements seront accueillies avec le plus grand plaisir.

De De Havilland Aircraft Co., Ltd., bevindt zich in de gunstige positie, vliegtuigen te kunnen ontwerpen, te bouwen en uit te rusten, voor handeladoeleinden zoowel als voor wetenschappelijk of administratief gebruik. Aanvragen worden gaarne ingewacht.

El De Havilland Aircraft Co., Ltd. Esta compaña se halla en una situación sin igual para emprender el dibujo, constructión y equipamiento de los máquinas de aviación de todos classes para los propositos comerciales, scientificos ó administrativos. Se ruega a todos que pidan informes.

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Stag Lane Aerodrome, Edgware, Middlesex, ENGLAND.

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(*Continued from page 564.*)

Three second and three 3rd prizes were also obtained.

The journey by char-á-bancs took five hours each way. We started at 07.30, and after a 2½ hours' run we arrived at Maidstone, where a halt was called. After half an hour's interval we resumed the journey and arrived at Kenley just before 13.00 hrs.

On our arrival we were all glad to learn that F/Lieut. G. H. H. Maxwell, who had proceeded to Kenley by train the previous night to compete in some events which were to be run off in the morning, had won the high jump for us, and we also had our two competitors left in the final of the 120 yards hurdles. Our hopes of bringing back the Inter-Unit Cup rose at once, and I think it was at this stage that first mention was made of filling up the cup on our homeward journey. The cup, prior to our departure, was twice filled up at Kenley.

After a very jolly day's sport we left at about 20.30, having a very hearty send-off by the Group Officers.

Our little Samson, who is a member of our band, and who was leading man of our tug-of-war team, firmly believed that it was he and he alone who had won for us the tug-of-war final. He threw, by jerking the rope, two of our opponents clean off the rope (I believe they were jerked to Croydon), leaving our ten to pull against only 8 men.

We finally arrived back at 03.30 next day, thankful that it was Sunday, and grateful that we were excused parades, having one and all thoroughly enjoyed our day's sport.

## Cricket at Milton.

No. 3 Supply Depot, R.A.F., at Milton, has been doing well at cricket this season. Out of nine matches played eight have been won and one lost.

Results of matches were as follows :—May 4th.—Milton, 98 for 3 wickets, "Warrigals C.C.," Christ Church, 70. May 7th.—Milton, 217 for 4, "Outcasts C.C." Oriel College, 63. May 10th.—Milton, 160 for 6, Trinity College "A" Team, 53 (at Oxford). May 14th.—Milton, 63, Y.M.C.A. Oxford, 55. May 15th.—Pembroke College, 160; Milton, 78. June 1st.—Milton, 220 for 7; Keble College, 215 for 9. June 4th.—Milton, 108; King Alfred's School, 93 (at Wantage). June 7th.—Milton, 171 for 7; "Warrigals C.C.," Christ Church, 63 (at Oxford). June 8th.—Milton, 218 for 8; Air Ministry (Directorate of Equipment) 61 and 142 for 5. June 11th.—Milton, 184 for 7; Moulsford Hospital, 73 (at Moulsford).

Evidently the Milton team does not suffer from "Test" nerves.

## THE LIGHT BLUE SUIT.

(A Recruiting Song.)

(Addressed to all Grade A men under 30 who are out of work.)

You can see them in the evening,
Just look down Croydon way;
Giving glad eyes to the flappers,
Rosie, Phyllis, Maud or May.
Tommy had a lengthy innings,
Love for Jack had taken root;
But they are cut out by "The Airman"
In his Light Blue Suit.

He tells tales to Maud and Kitty
Of his thrilling escapades;
Sailing up amongst the Heavens,
And forced landings in the glades.
How he strafed the Bosch in Flanders,
Gave the wind up to the brute;
Now his lady killing's deadly
In his Light Blue Suit.

Now Wars are not all over;
We have flying still to do,
For the Empire needs defenders,
From the aerial point of view.
So, if for work you're looking,
And think that you will suit,
Come and join the Royal Air Force
And wear a Light Blue Suit.

F. G. E.

## THE R.A.F. PAGEANT.

The R.A.F. Pageant will take place at Hendon on July 2nd. Admission will be from 10s. to 2s. All profits will go to the R.A.F. Memorial Fund. Arrangements are being made to accommodate and cater for 100,000 spectators.

A varied and improved programme has been arranged. A model village complete with church, specially constructed on the aerodrome, will be destroyed by attack from Aircraft.

Miss Sylvia Boyden will carry out a double parachute drop. Two twin-engined bombers will be attacked by four scouts.

A kite-balloon will be brought down in flames and one's ancient and revered friend "Major Sandbags," entirely recovered from his serious death at last year's Pageant, will again hoax the spectators.—G. D.

## THE AERIAL DERBY.

The Handicapping Committee for the Aerial Derby has been appointed as follows :—Wing-Commander R. F. Briggs, D.S.O., O.B.E., R.A.F., Squadron-Leader R. M. Hill, M.C., A.F.C., R.A.F., Major T. M. Barlow, A.M.I.C.E., Capt. R. J. Goodman Crouch.

The Nieuport and General Aviation Co. will enter "Goshawk" and "Nieuhawk," but neither Messrs. L. R. Tait-Cox or J. H. James will be available as pilots, both being mounted on other machines for the race. It is hoped, however, two other pilots will be available for these machines.

Mr. Tait-Cox's mount will cause considerable surprise, as also will that of Mr. James.

The pilots for the Napier-Avro and the Handasyde monoplane are still doubtful.

Good progress is being made with the "Bamel," which, one understands, is now nearly completed.

Mr. Uwins, who is flying the Bristol "Jupiter" machine, went round the course on Saturday on a "Tourer." Great things are expected of his mount for the race.

The first of the official entries will probably be published next week. Entries for the race close on July 6th.—G. D.

## THE 'VARSITY AIR RACE.

The first Oxford versus Cambridge Air Race will take place at Hendon on July 16th, Aerial Derby Day. The race will be flown at 14.30 hrs. prior to the start of the Derby, and will be three times round an out and home course, the total length of which will be about 100 miles.

The whole of the expenses of the race will be borne by the Royal Aero Club who are lending all the machines free.

The machines will be 180-h.p. "Viper" engined S.E.5s, and these are now being prepared at Croydon Aerodrome. The rudders and tail fins of the opposing machines will be painted the particular University blue. As the race is not looked upon with favour by the never-up-to-date University authorities, presumably there will be no official flying "Blues" awarded, though one is open to correction on this point.

The three pilots for each team will be selected from the following. Oxford :—A. K. Boeree (Oriel), A. V. Hurley (Keble), N. Pring (New), S. M. Brown (Brasenose), J. A. I. Hardman (Hertford), A. S. Hett (Oriel).

Cambridge :—H. A. Francis (Caius), C. O. B. Beale (Trinity), I. A. J. Duff (Trinity Hall), R. K. Muir (St. Catharines), W. S. Philcox (Caius), S. H. Starey (Trinity).

It will be noted that it is the colleges with the more go-ahead reputations in both Universities which are providing the pilots, but there is no entry from the very live "Pemmer."

The teams will be quartered at Croydon Aerodrome shortly, where practice will be.—G. D.

## THE GRAND PRIX.

The third and final attempt to gain the Grand Prix of the French Aero Club took place on June 20th, and the Farman "Goliath" successfully complied with the conditions and thus secured the prize of 100,000 francs.

Apparently all the other competitors failed to start. The Nieuport is said to have been disqualified on the ground that its Darracq-built Coatalen engines contained British parts.

The route laid down for the contest was Paris-Lille-Paris-Pau-Paris-Metz-Paris, a distance of roughly 1,400 miles. The Goliath carried three pilots, Messieurs Boussotrot, Gronin and d'Or, who flew in relays, and completed the journey in 24 hours. 8 mins. gross. The actual flying time was 21½ hours. The average speed over all was just over 57 m.p.h.

## M. POULAIN HOPS.

According to the daily press, M Gabriel Poulain, the well-known racing cyclist, has resumed tests with his "Aviette," and on Saturday morning at the Longchamp racecourse, succeeded in hopping some 10 to 15 yards at a maximum height of round about 2ft

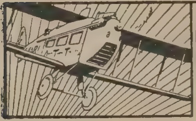
M. Poulain is announced as being satisfied that with practice he will be able eventually to cover hundreds of yards in this manner. As far as can be gathered the machine is still a bicycle fitted with wings, and the modus operandi adopted is that of pedalling vigourously with the tail up till a high speed is reached, and then increasing the angle of attack. Short hops are obviously possible by such methods, but they hold out no prospects of producing useful results.

## M.P.'S AIRSHIP TRIP.

A party of some forty Members of Parliament paid a visit to Pulham Airship Station on Friday, June 17th, and sampled travel by airship. R 36 was the ship employed, and the route taken was via Beccles and Lowestoft, out to sea, and then back parallel to the coast, passing Yarmouth and Caistor, back to Yarmouth, and then west inland to Pulham, a total distance of about 100 miles.

The visitors were received by Sir Frederick Sykes, aided by General Festing and Group Captain L. F. Blandy.

Judging by photographs which have appeared in the press the visitors were amply provided with refreshments on their trip, and enjoyed themselves thoroughly.



# COMMERCIAL AERONAUTICS
## AND CIVIL AERIAL TRANSPORT.

## THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

### CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type/of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS:—A.D.—Aircraft Disposal Co. B.A.—Berkshire Aviation Company. B.C.—Bristol Aeroplane Company. B.M.—Brompton Motor Company. C.A.—Dept. of Civil Aviation. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Petters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aeriens (S.N.E.T.A.).

### The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

JUNE 13th:

K.L., Fokker, H-NABM, London-A'dam, 10.09-13.37, G.M., 2, Olley.
I.L., DH18, G-EAWO, London-Paris, 10.40-12.47, G.M., 5, Robins.
G.E., Goliath, F-GEAC, London-Paris, 12.28-14.15, G.M., 4, Bechler & 1.
M.A., Breguet, F-CMAI, London-Paris, 16.20-18.35, Nil, Nil, Charpentier
M.A., Breguet, F-CMAR, Paris-London, 09.40-12.43, M., 2, Donelin.
H.P., HP, G-EATM, Paris-London, 11.20-15.00, G., 6, McIntosh & 1.
M.A., Spad, F-CMAY, Paris-London, 11.40-14.30, Nil, 2, Delily.
S.N., DH9, O-BELG, Brussels-London, 12.24-15.40, G.M., 2, Catta.
M.A., Breguet, F-CMAQ, Paris-London, 12.47-15.55, G.M., Nil, Portal.
G.E., Goliath, F-GEAI, Paris-London, 13.45-16.27, G., 6, Labouchere & 1
K.L., Fokker, H-NABI, A'dam-London, 14.00-18.38, G.M., 2, Hinchcliffe.
I.L., DH18, G-EAWO, Paris-London, 16.08-19.00, G., 4, Robins.

JUNE 14th:

K.L., Fokker, H-NABI, London-A'dam, 10.05-14.10, G.M., 2, Duke.
M.A., Breguet, F-CMAR, London-Paris, 10.17-12.40, G., Nil, Donelin.
I.L., DH18, G-EARO, London-Paris, 10.49-13.05, G., 2, Powell.
A.D., DH4, G-EAXE, London-Brussels, 10.50-12.45, Nil, Nil, Piercey.
M.A., Breguet, F-CMAQ, London-Paris, 12.10-14.30, Nil, 2, Portal.
S.N., DH9, O-BELG, London-Brussels, 12.25-14.47, G.M., Nil, Catta.
G.E., Goliath, F-GEAI, Ldn-Paris, 12.57-15.05, G.M., 7, Labouchere & 1.
M.A., Spad, F-CMAY, London-Paris, 15.50-17.57, Nil, Nil, Delily.
M.A., Breguet, F-CMAL, Paris-London, 09.40-12.22, G.M., 2, Paille.
S.N., DH4, O-BARI, Brussels-London, 12.44-15.15, G.M., 2, Van Opstal.
G.E., Goliath, G-GEAB, Paris-London, 12.55-16.25, G., 5, Favreau & 1.
M.A., Breguet, F-CMAM, Paris-London, 13.00-15.40, G.M., Nil, Delage.
K.L., Fokker, H-NABM, A'dam-London, 14.00-17.05, G.M., 3, Hofstra.
I.L., DH18, G-EARO, Paris-London, 16.00-18.40, Nil, Nil, Powell.

JUNE 15th:

K.L., Fokker, H-NABM, London-A'dam, 10.05-12.30, M., 2, Hofstra.
M.A., Breguet, F-CMAL, London-Paris, 11.05-13.37, Nil, 4, Paille.
I.L., Vimy, G-EASI, London-Paris, 10.38-13.20, G.M., 11, Chattaway.
S.N., DH4, O-BARI, London-Brussels, 12.22-14.50, G., 1, Van Opstal.
G.E., Goliath, F-GEAB, London-Paris, 13.22-16.15, G., 10, Favreau & 1.
M.A., Breguet, F-CMAM, London-Paris, 16.08-18.25, G., 2, Delage.
A.D., DH4, G-EAXJ, London-Brussels, 17.22-19.41, Nil, Nil, Muir.
M.A., Spad, F-ACMD, Paris-London, 09.35-12.30, M., 5, Briere.
H.P., HP, G-EATK, Paris-London, 11.10-14.45, Nil, 8, Wilcockson & 1.
H.P., DH4, G-EAWH, Paris-London, 11.12-13.30, Nil, 2, Perry.
S.N., DH9, O-BELG, Brussels-London, 11.50-14.15, G.M., 1, Catta.
G.E., Goliath, F-FHMY, Paris-London, 13.00-16.13, G., 4, Gaston & 1.
M.A., Spad, F-CMAY, Paris-London, 13.02-15.40, G.M., Nil, Le Sec.
M.A., Salmson, F-CMAN, Paris-London, 13.05-15.44, G., Nil, Rauge.
K.L., Fokker, H-NABI, A'dam-London, 14.45-17.43, G.M., Nil, Holmes.
M.A., Breguet, F-CMAR, Paris-London, 16.20-19.05, Nil, 1, Donelin.
M.A., Breguet, F-CMAQ, Paris-London, 16.21-19.14, M., 3, Revenue.
I.L., Vimy, G-EASI, Paris-London, 16.22-19.22, G., 11, Chattaway.

JUNE 16th:

K.L., Fokker, H-NABI, London-A'dam, 10.20-15.05, G.M., 2, Hinchliffe.
M.A., Salmson, F-CMAN, Paris-London, 10.20-12.40, G., Nil, Rauge.
M.A., Spad, F-CMAY, London-Paris, 10.22-12.30, Nil, 1, Le Sec.
I.L., DH18, G-EAWO, London-Paris, 10.28-12 40, G., 7, Robins.
S.N., DH9, O-BELG, London-Brusels, 12.28-15.06, G.M., 2, Catta.
M.A., Spad, F-ACMD, London-Paris, 16.06-18.30, Nil, 4, Briere.
M.A., Breguet, F-CMAI, London-Paris, 16.31-19.10, Nil, Nil, Portal.
M.A., Breguet, F-CMAI, Paris-London, 09.50-13.01, G.M., 2, Portal.
S.N., DH9, O-BATA, Brusels-London, 11.51-14.21, G.M., 3, Sahnovsky.
G.E., Goliath, F-FHMU, Paris-London, 12.45-15.37, G., 4, Bechler & 1.
M.A., Breguet, F-CMAM, Paris-London, 13.30-16.17, G.M., Nil, Delily.
K.L., Fokker, H-NABM, A'dam-London, 13.57-16.46, G.M., Nil, Duke.
I.L., DH18, G-EAWO, Paris-London, 15.45-18.25, G., 8, Robins.
M.A., Spad, F-ADAE, Paris-London, 16.46-19.40, G.M., 3, Paille.

JUNE 17th:

K.L., Fokker, H-NABM, London-A'dam, 10.10-14.04, G.M., 1, Holmes.
M.A., Breguet, F-CMAR, London-Paris, 10.20-12.50, G., 2, Donelin.
M.A., Breguet, F-CMAQ, London-Paris, 10.23-12.50, G., 2, Revenue.
I.L., Vimy, G-EASI, London-Paris, 10.27-13.10, G.M., 8, Powell.
S.N., DH9, O-BATA, London-Brussels, 12.44-15.08, M., 3, Sahnovsky.
G.E., Goliath, F-FHMU, London-Paris, 13.11-15.45, G.M., 9, Bechler & 1.
A.D., DH4, G-EAXH, London-Brussels, 14.35-16.45, Nil, Nil, Piercey.
H.P., HP, G-EATM, Paris-London, 11.05-14.01, Nil, 6, McIntosh & 1.
H.P., HP, G-EATN, Paris-London, 11.15-14.15, Nil, 6, Rogers & 1.
M.A., Breguet, F-ADAH, Paris-London, 11.55-14.10, Nil, 3, Challoux.
S.N., DH4, O-BALO, Brussels-London, 11.59-14.35, G.M., 2, Van Opstal.
M.A., Spad, F-CMAY, Paris-London, 13.15-15.45, G.M., Nil, Le Sec.
G.E., Goliath, F-GEAB, Paris-London, 14.05-17.04, G., 11, Labouchere & 1
K.L., Fokker, H-NABH, A'dam-London, 14.10-17.23, G.M., 2, Hofstra.
I.L., Vimy, G-EASI, Paris-London, 16.00-18.54, G., 10, Powell.
M.A., Spad, F-ACMF, Paris-London, 16.30-20.08, M., 3, Perignon.

JUNE 18th:

K.L., Fokker, H-NABH, London-A'dam, 10.06-14.25, G.M., 2, Hofstra.
M.A., Spad, F-ADAE, London-Paris, 10.12-12.35, G., 4, Paille.
I.L., DH18, G-EAWO, London-Paris, 10.25-12 40, Nil, 8, Robins.
I.L., DH18, G-EARO, London-Paris, 10.26-12.40, G., 8, Chattaway.
M.A., Breguet, F-CMAM, London-Paris, 10.30-13.05, G., 2, Delily.
S.N., DH4, O-BALO, London-Brussels, 12.46-15.05, G.M., 2, Van Opstal.
M.A., Breguet, F-ADAH, London-Paris, 16.00-18.07, G., 3, Challoux.
G.E., Goliath, F-GEAB, London-Paris, 16.10-18.30, G., 12, Labouchere & 1
M.A., Spad, F-CMAY, London-Paris, 16.55-18.55, G., Nil, Le Sec.
M.A., Breguet, F-CMAQ, Paris-London, 09.50-12.40, G.M., 4, Portal.
S.N., DH9, O-BELG, Brussels-London, 11.54-14.40, G.M., 1, Catta.
S.N., DH9, O-BATA, Brussels-London, 11.51-14.43, G., Nil, Grangam.
K.L., Fokker, H-NABM, A'dam-London, 14.40-17.15, G.M., Nil, Olley.
G.E., Goliath, F-GEAC, Paris-London, 15.17-19.10, G., 12, Favreau & 1.
I.L., DH18, G-EARO, Paris-London, 16.02-18.40, G., 7, Chattaway.

JUNE 19th:

M.A., Breguet, F-CMAQ, London-Paris, 10.50-13.05, G., 2, Portal.
H.P., HP, G-EATN, Paris-London, 15.30-19.00, Nil, 5, McIntosh & 1.

### Inland Flying at Croydon.

June 13th.—H.P., HP, Martlesham return (Perry); S.F., Avro from Cambridge (Ortweiler).

June 14th.—H.P. HP and DH4 to Cricklewood (Perry and Rogers); S.F. Avro joy-rides (Muir).

June 15th.—S.F., Avro joy-rides (Muir); K.L., DH9, tests (Hinchcliffe); H.P. HP to Cricklewood (McIntosh).

June 16th.—S.F. Avro joy-rides (Muir).

June 17th.—S.F., Avro joy-rides (Muir); B.C., Bristol from Bristol (Uwins).

June 18th.—H.F., 2 HPs to Cricklewood (McIntosh and Wilcockson); S.F. Avro (joyrides) Muir); I.L., DH4, test (Barnard); B.A. Avro from Hertford (Robinson).

June 19th.—B.A. Avro to Dunstable (Robinson); S.F. Avro joy-rides (Muir).

### Air Port Statistics.

CONTINENTAL.

Machines, 91; Passengers, 300; Crews, 107; Total Personnel, 407.

This does not include a few passengers who flew from Cricklewood on Hardley Pages.

Corresponding week, 1920:—

Machines, 94; Passengers, 194; Crews, 117; Total Personnel, 311.

### The London Terminal Aerodrome.

Though there has been an enormous amount of flying during the week, there have been no events of outstanding importance. The actual structure of the moving mast is now complete, and stands 122ft. in height There will, however, be a further 10 or 15ft. added which will consist of the landing stage and the actual mooring arrangement.

A spiral staircase with square sides (Herr Einstein will probably be able to explain this with the help of a theory not unconnected with Relativity) has been built up the inside of the mooring mast, the ascent of which is no more dangerous than that of a tube railway "short stairway to street." There is, however, just room to install a small lift up the centre.

There is a dear little man who looks after the "Airship-stick" when the builders are away. If anyone is feeling bored, it is well worth while walking across from the sheds and asking the said dear little man (who must surely be a blood-relation of "Old Bill") for permission to climb the structure.

Mr. Piercy, "the missing airman" of the newspapers during the past week had continued delivering D.H.4s and other craft to Belgium during the week. What he is "a-missing of" seems to be wropt in mystery.

Mr. Muir took a D.H.4 for the Aircraft Disposal Company to Brussels during the week. He returned in a Sneta D.H.9 the following day, a trip which he appeared to have enjoyed thoroughly, at any rate as a sensation, and as a novel experience in being landed.

Mr. Robinson came in from Hertford on an Avro belonging to the Berkshire Aviation Co. on Saturday, and went off again to Dunstable on Sunday.

Mr. Uwins arrived from Bristol on Friday on a "Tourer." He made several extended flights, including a gallop round the Aerial Derby course. The "Puma" Bristol, as fitted by the Bristol Aeroplane Co. themselves, is a very neat and efficient job.

On Sunday night Mr. McIntosh arrived on an H.P. from Paris, making a really pretty landing which was excellently judged. One of the passengers was a nigger, and another had a brown suede hat.

On Tuesday of last week the R.36 passed over the aerodrome carrying a party of journalists. Croydon is now fairly well up in journalistic habits, so consequently the inhabitants "stood from under" the airship with great caution in case any of the said journalists should drop any of their toys. The caution of the aerodrome habitués was, however, entirely unnecessary. All that happened was that a couple of cast iron sinkers each weighing a hundredweight or so, which came adrift from parachutes bearing journalistic messages, were dropped onto some neighbouring tennis courts. They did not fall within three feet of any human being. Some people are so easily scared. The parachutes containing the "copy" also reached ground, and fortunately they did not hit anybody either, for judging by subsequent reading their contents must have been heavier than the sinkers.

Apropos nothing in particular one wonders whether foreigners, naturalised, acclimatised, or whatever they have become since the war, will be allowed to serve with the British subsidised air lines, in spite of the new regulations, one would suggest that the Department of Civil Aviation should enquire into this in view of the number of men of British birth and origin who served in the Royal Air Force during the war, many of whom are now without jobs at all.

### THE INSTONE AIR LINE.

First and foremost, congratulations to Mr. and Mrs. Chattaway on the arrival of a son on June 6th. One is told that this new Instone Air Liner is thoroughly airworthy, judging by his lung capacity.

On Saturday the *Daily Mail* had a photograph of Mr. Barnard and his dog "Brown," the legend attached, stating that Brown had flown more than 17,000 miles. This would seem to contain as much truth as the majority of statements anent aviation which have appeared from time to time in the daily press. Brown only arrived on this earth six months ago, so he must have flown in every Instone Air Liner since his birth. And if he has been to Paris, where the mileage comes from, he ought to be in quarantine.

The I.A.L. have been working hard this week. A machine now leaves Croydon at 10.30, arrives at Le Bourgêt at 13.00, leaves Le Bourgêt at 16.00, and arrives at Croydon at 18.30. The "Vimy" and the two D.H.18s (RO and WO) have been used.

Mr. Barnard was flying well on the D.H.4 on Saturday afternoon, showing it off to great advantage. It has been booked for a long flight to-day (Wednesday).

The Westland is expected back from Yeovil at any moment, and it is likely one would imagine that the I.A.L. will obtain the 10 passenger Bristol Napier which should have been tested by Mr. Uwins yesterday (Tuesday).

### HANDLEY PAGE TRANSPORT.

(*With acknowledgments to "A Night Out."*)

O/400s have been flying
For a long, long time,
Getting off Croydon they find trying,
It's a weary uphill climb,
Though they're never on the light side,
Somehow they blunder through,
Now they're loaded on the right side,
It's the only thing to do.

It'll be all the same, just the same,
A hundred years from now,
No use a-worrying, no use a-flurrying,
No use kicking up a row.
I shan't be here, you won't be there,
When a hundred years are gone,
But O/400s to Paris still will fly,
And the world will still go on.

[And probably the subsidy as well.— Ed.]

### THE SURREY FLYING SERVICES.

Mr. Ortweiler returned on Monday from Cambridge on the Avro which had evidently done a fair amount of work over the Granta.

Mr. Muir has been out almost every day with the Avro, taking passengers. On Sunday he went for an extended flight over Norwood and Beckenham, turning over the Crystal Palace Grounds.

The Surrey Flying Services now have Mr. Fagg as assistant ground engineer. Mr. Fagg was an air mechanic in the old days of the R.F.C. before the war, having been stationed at Montrose with the famous No. 2 squadron.

### THE FLYING DUTCHMEN.

On Saturday Mr. Leverton delayed the start of the Fokker for five minutes because one of the passengers had not arrived. Two minutes after the machine had left the passenger arrived, and was quite indignant until Mr. Leverton pointed out that it was a great favour and, moreover, upset the whole working of the line for the machine to have been delayed even five minutes. That passenger has now learnt that Mr. Leverton's Fokkers have joined the Time and Tide Trade Union, and will definitely wait for no man.

Mr. Hinchcliffe put up a most spectacular performance on Wednesday in a D.H.9 purchased from A. T. and T. Ltd. for K.L.M. It is so long since the war that one has come to regard the D.H.9 as a solid commercial machine which simply "commershes" and nothing else. Mr. Hinchcliffe indulged in spinning nose-dives and loops on which he was gaining height which really made everyone gasp.

It is to be hoped that Mr. Hinchcliffe will bring over a Fokker for the R.A.F. Pageant on July 2nd so that the R.A.F. and others will be able to see this interesting machine. It would be good propaganda for his firm.

### THE LONDON TERMINAL AERODROME SPORTS CLUB.

The employees of the London Terminal Aerodrome, Croydon, have recently formed a Sports Club. A piece of ground on the old aerodrome has been given to the Club by the Air Ministry, and on this there will be a cricket ground and practice nets, and lawn tennis courts. There will also be a football ground during the winter.

Major S. T Greer, C.A.T.O., at the aerodrome was unanimously elected president, which fact should alone ensure the success of the club.

In the matter of subscriptions the French firms took the initiative, and said that they would each subscribe £5 provided that the British firms would do the same. The British firms, or at any rate some of them, gallantly contributed £5. Owing to the present strained state of finance it would seem to have been very reckless of them to disgorge this vast sum, even as a percentage of their subsidy, though, of course, very generous.

The first general meeting was held at the Aerodrome on 31st May. Major Greer was then appointed President. Mr. G. W. Thompson was made Hon. Secretary, with Mr. W. J. S. Homewood as Hon. Treasurer. Messrs H. Gash, F. M. Dean, G. Powell, and S. Miller were elected to the committee.

The second general meeting was held on 16th June, and the committee reported progress, and that everything was ready for play. Rules was drawn up, submitted, and passed. The original working committee was cancelled, and a management committee was formed to manage the whole club. Sub-committees were formed, one each to manage Lawn Tennis, Cricket, and Football. One member from each of these committees will be appointed to the management committee.

It is proposed during the winter months to run concerts, dances, etc., for the benefit of the club funds.

The club membership now stands at 65, and it is to be hoped that this number will soon be increased.

The Secretary would be glad to hear from Cricket and Football Clubs of moderate strength who have any vacant dates, and who could arrange to play at the Aerodrome Ground on Wednesday or Saturday afternoons.—G. D.

## FIVE-SEATER HANDLEY PAGES.

One is informed that the number of passengers, in addition to the pilot and mechanic, which the Handley Page twin-engined aeroplanes are licensed to carry has now been reduced to five.

One would suggest that it would be very much cheaper and less unfair to the taxpayer's pocket if these aircraft were now once and for all superannuated, and if the D.H. 16s. now held by the liquidator of Aircraft Transport and Travel Ltd. were purchased by the Air Ministry, and let out to H.P.T. on the present hire-purchase system. This would materially reduce the "running costs" on which, under the present agreement, the taxpayer pays a percentage of profit to the air line.

The Handley Pages with two Rolls-Royce engines now carry one pilot, one mechanic, and five passengers at about 65 m.p.h. The D.H.16s. with either one Rolls-Royce "Eagle" or one Napier "Lion" will carry one pilot and four passengers at more than 100 m.p.h. at the least.

Thus it will be seen that two D.H.16s would be vastly cheaper and more efficient to run than one Handley Page.

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# AIRCRAFT IN PARLIAMENT

On June 8th, Captain GUEST, replying to Mr. RAPER, said: "Certificates of airworthiness are not issued by the Aeronautical Department, but that Department is responsible for ascertaining the manner in which certain of the conditions of issue are carried out by the owner or constructor, and making recommendations thereon to the Civil Aviation Department, which is responsible for the issue of the certificates. A foreign aircraft owner is not debarred by our Regulations from obtaining a British certificate of airworthiness for his aircraft. The conditions upon which such certificates are issued, however, include certain requirements in regard to supervision during construction which could not be fulfilled in the case of aircraft constructed abroad."

Mr. RAPER, in a supplementary question, asked: "Would it not be a great advantage for this country at any rate if we could induce the foreign aeroplane people to accept our certificate as a standard of quality in the same way in which they take a Lloyds' certificate for shipping?" In reply, Captain GUEST said that the point was appreciated, but that the difficulty would be that the machine would have to be inspected during several stages of construction.

Replying to Sir A. S. BENN, who asked whether foreign machines are allowed to carry British passengers without being inspected by the British authorities, Captain GUEST said that at this stage the responsibility must rest with the passenger who selects the service he prefers.

In a written answer to Mr. RAPER, who asked whether the Postmaster-General would consider sending letters to the Continent by air mail in order to give an accelerated service in return for the greater cost of postage, Mr. KELLAWAY said that an accelerated service to the Continent could not be provided by air so long as aeroplanes do not fly at night.

One suggests to Mr. Kellaway that this reply is sheer nonsense. Only by air can letters be posted in the morning and delivered in Paris the same evening. But for this fact the air mail service should not exist or should merely be considered as a toy.

* * *

On June 9th, Mr. MOSLEY asked the PRIME MINISTER "whether his attention had been called to the statements contained in Paragraph 10 of the Report of the Comptroller and Auditor-General upon the Appropriation Account of the receipt and expenditure for air services dated March 18th, 1920, to the effect that a sum of about £76,000 had been expended in connection with the Cairo-Capetown air route, whereas the sum sanctioned by the Treasury was £3,000, whether any explanation of the occurrence has yet been furnished by the Air Ministry; and what action is contemplated for the re-establishment of Treasury control over the spending departments.'

Sir ROBERT HORNE said that this expenditure took place in the Financial years 1919-20 and 1920-21, and a report to the Public Accounts Committee is awaited.

Incidentally it might be well to note that R.A.F. officers employed in making aerodromes on this route are seriously out of pocket, having been deprived of flying pay and paid only at the old infantry rate while engaged on this work

* * *

On June 13th, Capt. BAGLEY asked the Parliamentary Secretary to the Admiralty whether during the War the sum of over £4,000,000 was spent by the Naval Air Department upon American motor launches at a cost of £8,000 each for which purchasers are now vainly sought at £100; whether any inquiry has been, or will be made as to the circumstances of the contract, and the price paid for these launches; and who was the director of the Department at the time.

Mr. AMERY said that no American motor launches were purchased specially for the Naval Air Department during the War. The remainder of the question does not therefore arise.

Apparently Captain Bagley is barking up the wrong tree. There is somewhere, of course, a scandal concerning these American motor launches, and it seems possible that certain members of the Cabinet at the time, when the contract was placed know rather more about it than most other people, but one is glad to know that the Air Department of the Admiralty had nothing to do with this contract.

* * *

On June 14th, replying to Lieut.-Col. NALL (should his name be Know-all), who asked whether the Lord Privy Seal was aware that the Air Ministry employs 4,300 persons in offices for duties which were performed by the War Office and Admiralty in 1913; and whether the Government intends, in the interest of economy, to abolish the Ministry of Labour, the Air Ministry, the Development Commission, etc. Mr. CHAMBERLAIN said that he could not accept the suggestion that the work of the Air Minuistry to-day is no greater than that performed in respect of the air by the War Office and Admiralty before the War, nor that excesses in some Departments are a reason for abolishing other Departments which have no connection with them.

In a written answer on June 14th to Capt. BAGLEY, who asked the Parliamentary Secretary to the Admiralty whether an inquiry was held into the accounts of the Naval Air Department in relation to the payment of alleged improper commission of over £200,000 on a contract for Curtiss aeroplanes; with what results; how much of this commission was afterwards recovered at the Old Bailey, and who was the Director of this Department at the time; Mr. AMERY said: "An inquiry was held in 1917 into the circumstances in which commission was paid by the Curtiss Company to agents in this country on orders placed by the Admiralty. The inquiry showed that a sum of £130,000 had been so paid, half of it to a United States' citizen named Seeley, and half to an English barrister named Casson, and that of the latter portion three-forths was held by Casson in trust for the late Wing Commander Porte. Casson and Porte were prosecuted, and the former was sentenced to pay a fine of £6,000; the case against Wing-Commander Porte was withdrawn for reasons fully stated in Court. A sum of £43,353 18s. 3d. was recovered from Casson and Porte. Two officers served successively as directors of the Department during the period covered by the payment of this improper commission, but there has never been any suggestion that either could have been aware of the payment of the commission."

It is difficult to judge whether Capt. Bagley, in asking this question, was moved by motives of economy or whether he intended to cast aspersions on Rear-Admiral Sueter's administration of the Air Department, Admiralty. One is under the impression that it was made quite clear in the course of the Porte case that Commodore Sueter (as he then was) had full knowledge of Commander Porte's connection with the Curtiss Company, which was formed before the war, when he was for practical purposes a civilian. It is only to be regretted that this question was not used as an opportunity for exposing the gross miscarriage of justice of which Commander Porte was the victim.

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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... 579
Aircraft Disposal Co., Ltd., The ... 574
Arrol-Johnston, Ltd. ... *Front Cover*
Auster, Ltd. ... *Front Cover*
Bray, Gibb & Co., Ltd. ... 580
Bristol Aeroplane Co., Ltd. ... 566
Brown Brothers, Ltd. ... 579
Cunard Line ... 580
De Havilland Aircraft Co., Ltd., The ... 574
Fairey Aviation Co., Ltd., The ... 563
Firth, Thos., & Sons, Ltd. ... 578
Instone Air Line ... *Front Cover*
Napier, D., & Son Ltd ... 565
Naylor Brothers (London), Ltd. ... 580
MacLennan, John, & Co. ... *Front Cover*
Roe, A. V., & Co., Ltd. ... *Inside Front Cover*
Rolls-Royce, Ltd. ... 569
Rubery, Owen & Co. ... 578
Sankey, J. H., & Son, Ltd. ... 578
Sunbeam Motor Car Co., Ltd. ... 571
Supermarine Aviation Works, Ltd., The *Back Cover*
Titanine, Ltd. *Front Cover & Inside Back Cover*
Vickers, Ltd. ... 573

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# ON THE ROYAL AIR FORCE PAGEANT.

On Saturday next, July 2nd, the R A.F. Pageant takes place at Hendon, for the nonce again London's leading aerodrome. The following notes have been received from more or less official sources :

Their Majesties the King and Queen have graciously consented to be present, and Wing-Commander H.R.H. the Duke of York, R.A.F., will accompany the Royal Party. Invitations have also been extended to the Dominion Prime Ministers to be present. It is understood that they will fly to Hendon from Croydon.

A special traffic scheme has been prepared to cope with approximately 100,000 people, and the enclosures at Hendon, having been doubled in size specially for the occasion, will comfortably accommodate the largest crowds. The tube service to Golder's Green is being increased and special omnibus services from Golder's Green to the aerodrome will run in connection with the tube service. Metropolitan trains will also be run every few minutes to Willesden Green, the tram service to the aerodrome being largely augmented.

Road traffic problems have been carefully considered in the light of recent experience in traffic control from the air, and motor-cars from London are recommended to proceed *via* Golder's Green and Hendon. Special sites for motor-coaches have been provided and will be allocated in advance upon application.

It is probable that R 33 will make a preliminary survey of the routes on June 30th, and will be used for control on the day of the Pageant.

The Pageant will begin at 3 p.m., but preliminary heats for various flying races between different types of machines and inter-Squadron competitions will start at 12 o'clock.

Royal Air Force Bands will play from 1 p.m. The gates will, therefore, be open from 11.30 a.m., and the public are strongly advised to arrive early.

A new road has been created on the east side of the aerodrome to give admittance to a new, enlarged 2s. enclosure. Tickets, from 2s. to 10s. (cars, 5s.; boxes, £6 to £10), can be obtained in advance from the usual agencies.

It is well to remember that the Aerial Pageant is an integral and important part of the annual training of the Royal Air Force, and fulfils the same functions as does the Royal Tournament in the case of the Army and Navy. Different squadrons, such as fighting, bombing and reconnaissance, which carry out the varied work of the Royal Air Force, are brought together and gain that keen stimulus to efficiency which is provided by inter-unit contests and displays carried out before a critical audience. As in the case of the Royal Tournament, all the proceeds are devoted to Service charities. This for the benefit of silly M.Ps. who ask silly questions as the result of a mis-directed Anti-Waste agitation.

### THE PROGRAMME.

The following is the programme :—

1. (15.00 hrs.).—Handicap Race, machines to start in the following order : Handley Page, Avro, Vimy, Bristol Fighter, Snipe, D.H.9a, S.E.5, Bat, Nighthawk. (Course :—Hendon, Bittacy Hill, Welsh Harp (Tower), Bittacy Hill and Hendon. The finishing line is in front of the Royal Box.)

2. (15.15 hrs.).—Fight between two Bristols and two Snipe.

3. (15.25 hrs.).—Final of Standard Avro Race. One machine will compete from each of the following stations :—Uxbridge, Cranwell, Hawkinge, Duxford, Shotwick, Spittlegate, Bircham Newton, Henlow, Andover, Netheravon, Kenley, Manston, Biggin Hill, Flowerdown and Halton. (Same course as Handicap Race 1.)

4. (15.35 hrs.).—Exhibition Flying by F/O Bulman on a Bat, with Wasp II engine.

5. (15.45 hrs.).—"Snipe" Formation Flying (led by Sqdn. Ldr. Draper of the C.F.S.).

6. (16.00 hrs.).—Fight between Nieuport "Nighthawk" (Siddeley engine), and Westland "Wagtail" (Wasp II engine).

7. (16.10 hrs.).—Formation Flying, Bristol Fighters (led by Sqdn. Ldr. Johnson, O/C 24 Squadron, Kenley).

8. (16.25 hrs.).—Slow trick flying by Flt.-Lt Longton on a Sopwith "Camel" (Clerget engine).

9. (16.35 hrs.).—Three Handley Pages will be attacked by Sqdn. Ldr. Draper's "Snipe" formation.

10 (16.45 hrs.).—A "Review of Ancestors." (N.B.—This review should have been headed by a "Maurice Shorthorn," but unfortunately all the "Maurices" are now decomposed. The oldest "Ancestor" is a B.E.2c.)

11. (16.55 hrs.).—Final of the Squadron Relay Race. (Teams from the following stations will compete : Duxford, Shotwick, Cranwell, Spittlegate, Bircham Newton, Hawkinge, Henlow, Halton, Andover, Netheravon, Kenley, Manston, Biggin Hill, Uxbridge. Each team will consist of an Avro, a Bristol and a Snipe.)

12. (17.20 hrs.).—"Crazy Flying" on an Avro by Flt. Lieut. Noakes.

13. (17.30 hrs.).—Parachute Descent from blazing Kite Balloon by "Major Sandbags, O.B.E.—with bar," who has quite recovered from his lamented death last year.

14. (17.40 hrs.).—Attack on a Village, by a detachment from Kenley.

15. (17.50 hrs.).—Artificial Cloud Screen (created by Handley Pages).

16. (18.00 hrs.).—Ground Smoke Screen (created by Handley Pages).

Altogether the Pageant promises to outdo everything which was done last year. All one need say to all one's readers is, "Be there!"—C. G. G.

# THE ROYAL AERO CLUB SEAPLANE RACES

The more one considers the Royal Aero Club's project for having their seaplane races on August Bank Holiday Monday and the following day at Cowes the more thoroughly unwise the Committee's decision appears. One gathers that the Committee and Members of the Royal Yacht Squadron are graciously pleased not to raise any objection to seaplanes performing over their sacred waters while yacht racing is in progress, but one is fully convinced that, so far as the ordinary yachting people gathered at Cowes are concerned, they would regard the seaplanes merely as an intolerable nuisance if they proceeded to race while the more important business of yacht racing was in progress.

Also, it is obviously foolish to hold the seaplane races on a Bank Holiday. A good many people in the Aircraft Industry have to work for their living, and value Bank Holidays as an opportunity to get away from their work. Running a seaplane race at Cowes, or being concerned therewith in any capacity, is uncommonly hard work. Therefore the proposal to hold the race on a Bank Holiday is not likely to be popular.

Added to that the intense inconvenience of getting to Cowes under any circumstances at any time will be accentuated in an attempt to get there on a Bank Holiday in the full knowledge that Cowes will be so crowded with yachting people that it will be impossible to find accommodation there on the nights preceding, during and after the seaplane races.

Also, it is well to remember that, finding accommodation elsewhere on the Isle of Wight is of no help in that any place on the Island is farther from any other place on the Island than it is from any place on the mainland, owing to the amazing lack of communication in that quaint region.

The Committee of the Royal Aero Club would do well to remind themselves that other people who are permanently concerned with aviation are not, as they are during their momentary incursions into aeronautical affairs, in the happy position of being able to get beds on the yachts of their wealthy friends.

There is the further objection that newspapers which are dealing with the yachting at Cowes will send their yachting correspondents, and the yachting correspondents will deal with the yachting. They will not concern themselves at all with the seaplane races, and so the seaplane races will be neglected by the Press.

If it is desired to make the Royal Aero Club's Seaplane Races a mere appendage to the Royal Yacht Squadron's Yacht Races at Cowes, instead of an event of the year, then at least the thing might be done properly. One gathers that

DO NOT FORGET THE R.A.F PAGEANT ON JULY 2nd.

the yacht racing lasts for four days—Monday, Tuesday, Wednesday, and Thursday. Obviously then the sensible thing to do is to hold the Seaplane Races on the Friday and Saturday of the same week. A certain number of intelligent yachting people would stay to see the seaplane races just as some of the motor boat people at Monaco stay to see the Seaplane Meeting there. Some of the yachting people would go away, and so it might be possible for mere aeroplane people to find accommodation at Cowes, and, as there will be no yacht racing on those two days, the Press in general would send their aeronautical people to report the seaplane races, which would then have a chance of securing a "good press."

The Royal Aero Club Committee has proved a most complete success in promoting the failure of seaplane racing since the war, and at the present moment it is going the right way to work to promote another howling failure this year. There is, however, still time for the Committee to reconsider its decision and make something of a success of its 1921 Seaplane Meeting.—C. G. G.

## A REVOLUTION IN HANDLEY PAGE TRANSPORT.

All those who are concerned for the welfare of British aviation and especially the many personal friends of Mr. Frederick Handley Page will be glad to hear that something very like a revolution has taken place in Handley Page Transport Limited.

As noted in this paper recently, Mr. Handley Page has been in America for some time on important business connected with the Handley Page Wing which one still firmly believes will revolutionise air transport. In his absence Handley Page Transport Limited has apparently fallen on evil days and it was perfectly obvious to anybody who had eyes to see that the running of the Transport business was being done in such a way as could only bring discredit on British Aviation and on the name of Handley Page. What contemporary aviators thought about it may best be judged from the jest commonly circulated at Croydon recently that the Handley Page Transport machines were in training for the long distance taxying record.

Evidently the lamentable state of the firm's activities has duly come to the knowledge of the very important people who are interested in the firm, with the result that Colonel Barrett Lennard who is connected with the Marconi Company was appointed some time ago to look into the firm's affairs. Colonel Lennard does not profess to know anything about aviation and in this he has an undoubted advantage over people who are too intimately connected with flying and are apt to be unable to see the wood because of the trees. He is, however, undoubtedly a thoroughly sound business man with the ability to grasp business problems. And the first public proof of this is his appointment of Ogilvie and Partners Ltd. to oversee and manage the whole technical side of the transport organisation.

This excellent step in the right direction was first broken to the habitués of Croydon by the appearance of Lieut.-Col. W. A. Bristow in the Handley Page office. Certain people in the R.N.A.S. may remember that during that most critical period of the War in 1918 Colonel Bristow had charge of all the matériel of the huge bombing operations carried on by the R.N.A.S. in Flanders. And it is obvious that the regular running of bombing machines, their ability to lift their loads, to travel set distances with regularity and to keep on doing the same thing day after day, involves problems precisely analogous to those involved in running a successful air transport line. It would be difficult to think of anybody whose war experience better fits him for this particular job than Colonel Bristow.

One feels sure that one is expressing the feelings of very many people connected with aviation when one says that this new arrangement is thoroughly to be commended. Not only does it safeguard the good name of Handley Page, which has always stood so high in the history of aviation both for enterprise and for performance of promises, but it introduces into the air transport world new forces in the personalities of Colonel Lennard and Colonel Bristow.

To all concerned one wishes the best of good fortune in the new arrangement, for even the most efficient of human beings needs a certain amount of good fortune if success is to reward ability.—C. G. G.

## THE DESERT ROUTE TO THE EAST.

It has been announced by the Air Ministry that a route has been opened across the desert between Palestine and Mesopotamia. The first three R.A.F. machines to use this route have arrived at Baghdad. These machines were part of a survey party that started from Palestine on June 1st to establish a more direct line between the aerodromes at Ramleh in Palestine and Baghdad in Mesopotamia.

The new route is about 590 miles and is considerably shorter than the northerly route formerly used. The line, which is an extension of the Cairo-Ramleh route, starts from Ramleh, which is the chief R.A.F. aerodrome in Palestine, passes through Amman in Trans-Jordania and Kasrazrak, where landing-grounds have been prepared, and thence goes in an almost straight line across the Arabian desert to Ramadie, on the Euphrates, and so to Baghdad.

Intermediate ground stations for use in forced landings will be ready shortly.

The distances between the principal stations are as follows: Ramleh-Amman, 65 miles; Amman-Kasrazrak, 55 miles; Kasrazrak-Ramadie, 400 miles; Ramadie-Baghdad, 60 miles.

The rest of the survey party travelled by cars, the aeroplanes co-operating by selecting the best air route. The landing-grounds chosen were marked by the ground party for future use.

Ramleh was the old German H.Q. aerodrome in Northern Palestine. The new route is thus a long way from being a direct route from Egypt to Baghdad. So far as one can learn the only direct flight across the desert from Egypt was made by Messrs. Parer and Macintosh on their D.H.9, with a Siddeley "Puma" engine, when they made a non-stop flight from Heliopolis to Baghdad on a compass course.

## TRAINING OF BOY MECHANICS, R.A.F.

The Air Ministry makes the following announcement:

As the result of examinations for the entry of Boy Mechanics into the Royal Air Force held in the first six months of 1921, approximately 500 boys will be taken into the Force.

The successful candidates will be allocated for training in various skilled trades in approximately the following proportions: Carpenters, 150; Coppersmiths, 30; Draughtsmen, 10; Fitters, 300; Pattern Makers, 10.

Boys accepted for service will be taken both from among those who have been nominated by the Local Education Authorities and who will be examined on the 5th July and those who sat in May for the open competitive examination held by the Civil Service Commissioners.

In assigning boys to the various trades, every endeavour is made to give effect to each boy's individual preference. The wishes of the boys in this respect will be considered in the order of their position on the examination results list.

Full particulars as to entry are given in the "Regulations in regard to the entry and training of Boy Mechanics, Royal Air Force" (Air Publication 134), which is obtainable on application to the Secretary, (A.E.), Air Ministry, Kingsway, W.C.2, from any Royal Air Force Recruiting Depot, and from any of the Local Education Authorities in the country.

## TRIALS OF R.38.

On Thursday night and Friday morning, June 23rd-24th, the R.38 made a successful first trial flight from the Royal Airship Works, Cardington, Bedford. The R.38 left Cardington at 21.55 o'clock on the 23rd and landed again, after a 6½-hours' flight over the Home counties, at 04.20 o'clock on the 24th.

The R.38 was commanded by Flt.-Lieut. A. H. Wann, R.A.F., and among those on board were Air-Commodores Brooke-Popham and E. M. Maitland, Mr. C. I. R. Campbell (Supt. of the Royal Airship Works), Flt.-Lts. I. C. Little (First Officer), J. E. M. Pritchard, R. S. Montague (Navigator), F/O C. F. Matthewson (Engineer Officer), and Commander L. H. Maxfield, U.S.N. and Lieut.-Comr. Beig, U.S.N., who will be C.O. and Engineer Officer respectively when the R.38 (or Z.R.2, as she will be known) is handed over to the U.S. Navy.

After further trial flights at Cardington and Howden, she will be handed over to the American crew, who will carry out such flights as they consider necessary to accustom themselves to the handling of the ship before departing on the trans-Atlantic flight to Lakehurst, N.J.

## VICKERS RUMOURS.

It is rumoured on the highest authority that Vickers Ltd. are preparing a machine on which Sir Ross Smith will attempt to fly round the world.

It is also said that the same firm are building an enlarged edition of the "Vimy" with Napier engines to carry 24 passengers. This is said to be for the Instone Air Line.

## AN ACCIDENT AT GRAIN.

It is reported upon reliable authority that tests of the Vickers "Valentia" flying-boat at Grain were discontinued last week, owing to breakage of the hull on landing. The cause of the accident is unknown and somewhat mysterious, as apparently a very good landing was made, and immediately thereafter the hull broke in two just abreast of the pilot's cockpit.

Flt. Lt. E. S. Goodwin, A.F.C., the pilot, was unfortunately washed into one of the airscrews, which was still rotating. He had both ankles broken and suffered other, but it is hoped minor, injuries. Wing Commander H. R. Busteed and the remaining four occupants escaped unhurt.

DO NOT FORGET THE R.A.F. PAGEANT ON JULY 2nd.

# R.A.F. SPORTS AND PASTIMES.

## The R.A.F. Athletic Championships

The Royal Air Force Championship Meeting was held in brilliant weather at Henlow on June 23rd and 24th. The opening day was mainly taken up with the individual championships. The proceedings on the second day opened with a most impressive parade of athletes, each team marching past led by the team captain who bore aloft his flag.

The team events for the King's Cup were then decided. This much-coveted trophy was won by Cranwell with the narrow margin of 2 points from Halton. It was left to the last event of the day to decide the issue This was a mile relay. Serjt.-Maj. Mawby ran the final quarter for Cranwell and brought his team from 4th place to 2nd—thus landing the King's Cup for his side amidst immense enthusiasm.

There was a great gathering of officers and their friends from all parts, and the pretty ground of the Astra Athletic Club presented a gay appearance. Air Vice-Marshal Sir J. M. Salmond, K.C.B., C.M.G., D.S.O., was referee, Air Vice-Marshal J. F. A. Higgins, C.B., D.S.O., A.F.C., and Air Commodore C. A. H. Longcroft, C.M.G., D.S.O., A.F.C., were chief judges of track and field events respectively, and Air Commodore the Rev. H. D. L. Viener, C.B.E., M.A., was chief timekeeper. The prizes were distributed by Mrs. J. F. A. Higgins.

The details are given below and a perusal of these will show that some excellent performances were put up. Several R.A.F. records went by the board.

INDIVIDUAL CHAMPIONSHIPS.

120 Yards Hurdles.—F/O Trundle (Halton) 1; F/O Luard (Uxbridge) 2; F/Lt. Bryson (No. 10 Group) 3; 6 yd., yd; 17 3/5th sec.

100 Yards.—S/M Mawby (Cranwell) 1; L/A/C Sargent (Irish Wing) 2; F/O Bayes (Uxbridge) 3; 2 yd., ins.; 10 2/5th sec. (R.A.F. Record).

220 Yards.—S/M Mawby 1; F/O Bayes 2; A/C Trapp (Henlow) 3; easily by 12 yd., 2 yd.; 23 sec., (R.A.F. Record).

440 Yards.—Sjt. Rufley (Halton) 1; A/C Cussin (Cranwell) 2; F/O Cording (Shrewsbury) 3; 8 yd., 3 yd., 54 3/5th sec.

880 Yards.—Cpl. Taylor (Halton) 1; A/C Snaith (Henlow) 2; Sjt. Pimm (Halton) 3; 3 yd., foot; 2 min. 6 4/5th sec.

Mile.—A/C Laing (Halton) 1; F/O Pyper (Uxbridge) 2; Cpl. Palm (Halton) 3; 2 yd., foot; 4 min. 49 2/5th sec.

Three Miles.—L/A/C Morgan (Irish Wing), 1; L/Cpl. Jarrott (Halton), 2; Cpt. Harley (Uxbridge), 3; 12 yd., 2 yd.; 16 min. 20 2/5th sec.

High Jump.—F/Cadet Nuttall (Cranwell), 5 ft. 10½ in., R.A.F. Record, 1; S/M Miller (Cranwell), 5 ft. 8 in, 2; A/C Slack (Cranwell), 55 ft. 3 in., 3. Nuttall cleared his jump with room to spare; he was unlucky just to touch the bar with his clothing in an exhibition jump of 6 ft

Long Jump.—S/M Miller, 21 ft. 2½ in., 1; A/C Slack, 20 ft. 10 in., 2; A/C Amos (Henlow), 19 ft. 10 in., 3.

Putting the Weight.—F/Lt Maxwell (No. 1 Group), 34 ft. 1 in., R.A.F. Record, 1; F/Sjt. Newby (Cranwell), 32 ft, 1 in, 2; Cpl. Blythe (Uxbridge) and S/M Mawby tied for third, 31 ft. 9 in.

Tug-of-War (First Round).—Henlow beat R.A.F. Depot (Uxbridge); rest byes. Second Round: No. 10 Group beat No. 1 Group; Irish Wing scratched to No. 3 Group; Cranwell beat Isle of Grain; Henlow beat Halton. Semi-finals: Henlow beat Cranwell; 10 Group beat No. 3 Group. Final: No. 10 Group beat Henlow by 2 pulls to 0. Both teams in the final were recently seen at the Royal Tournament, where the Gosport combination went very close to securing top honours.

TEAM EVENTS.

Mile Team.—Halton (A/C Laing 1, Cpl. Palm 3, L/A/C Clarke 4) 8 points, 1; Uxbridge (F/O Pyper, 2, F/O Catchpole 8, A/C Jones 9) 19, 2; Cranwell (F/Cadet Hautrey 5, Sjt. Holt 14, F/Cadet Shepherd 16) 35, 3; No. 10 Group (6, 17, 20), 43, 4; Henlow (12,15,19), 46, 5; Irish Wing (7,25,26), 58, 6. No other teams finished.

440 Yards Relay.—Cranwell (S/M Mawby, F/Cadet Hayter, A/Cs Mallin and Oussin) 1; 10 Group 2; Uxbridge 3; Halton 4; Henlow 5, 3 Group 6; 12 yd., 2 yd.; 47 2/5th sec.

880 Yards Relay.—Cranwell (same team as 440 yd.) 1; Uxbridge 2; Henlow 3; Halton 4; 10 Group 5; Irish Wing 6; 10 yd., 1 yd.; 1 min. 37 sec.

Mile Relay.—Cranwell (S/M Mawby, F/Cadets Hayter, Stevens, Sjt Coleman) 1; Uxbridge 2; Halton 3; 10 Group 4; 3 Group 5; Irish Wing 6; 3 yd., 8 yd.; 3 min. 44 2/5th sec.

2 Miles Relay.—Halton (Cpl. Taylor, Sjt. Pimm, Cpl. Palm, A/C Laing) 1; Uxbridge 2; Henlow 3; No. 10 Group 4; No. 3 Group 5; Cranwell 6; 30 yd., 8 yd.; 8 min. 39 2/5th sec.

Three Miles Team.—Halton (L/Cpl. Jarrott 2, A/C Reed 8, L/Cpl. Clarke 9) 19 points, 1; Cranwell, 22 points, 2; Uxbridge, 31 points, 3; No. 10 Group, 37 points, 4. No other teams finished. Flying Officer Watson was leading by over 100 yards when he collapsed after covering 1½ miles.

Putting the Weight.—Uxbridge (Sqdn/Ldr Hicks, 31 ft. 1 in., F/O Pope, 31 ft. 8 in., Cpl. Blythe, 31 ft. 9 in.), 94 ft. 6 in., 1; Cranwell, 94 ft. 5 in., 2; No. 10 Group, 88 ft. 10 in., 3; No. 3 Group, 87 ft. 1½ in., 4; Halton, 85 ft. 4 in., 5; Irish Wing, 81 ft. 4 in., 6.

High Jump.—Cranwell (F/Cadet Nuttall, 5 ft. 10¼ in., S/M Miller, 5 ft. 8 in., A/C Slack, 5 ft. 5 in), 16 ft. 11¼ in., 1; Irish Wing, 15 ft. 9 in, 2; No. 10 Group, 14 ft. 9 in., 3; Uxbridge, 14 ft. 5 in., 4; Halton, 14 ft. 4 in, 5; Shrewsbury, 6.

Long Jump.—Cranwell (S/M Miller, 21 ft. 2½ in., A/C Slack, 20 ft. 10½ in., A/C Malin, 19 ft. 3 in.), 61 ft. 4 in., 1; Henlow, 57 ft. 1½ in., 2; Uxbridge, 55 ft. 9½ in., 3; Halton, 55 ft. 4 in., 4; Irish Wing, 54 ft. 2 in., 5; No. 3 Group, 53 ft. 6½ in., 6.

360 Yards Hurdles Relay.—No. 10 Group (F/O Gairdner, F/Lt. Bryson, A/C Funnell) 1; Halton 2; Uxbridge 3; Henlow 4; 8 yd.; 55 2/5th sec.

440 Yards Boys Relay.—Cranwell 1; Halton 2; 12 yd.; 53 sec.

Team Championship.—(1) R.A.F. Cranwell 48 pts.; (2) R.A.F. Depot, Uxbridge, 46 pts.; (3) No. 10 Group, Lee-on-Solent, 41 pts.; (4) R.A.F., Halton, 40 pts.; (5) I.A.A.D., Henlow, 26 pts.; (6) No. 3 Group, Spittlegate, 13 pts.; (7) No. 11 (Irish) Wing, 11 pts.; (8) M.T.R.D., Shrewsbury, 1 pt.

## Henlow Notes.

ATHLETICS.—This week the R.A.F. Championships have kept us busy. An account of the meeting appears above. The visitors have afforded real pleasure to all ranks in the depot.

CRICKET.—On June 18th our 1st Eleven, playing away, were beaten by Old Warden, who put together 87 runs to our total of 68. Our 2nd Eleven, however, lowered the colours of Stotfold: I.A.A.D. 90; Stotfold 56. In this match A/C2 Weaver took 5 wickets for 8 runs. On the same day Depot Headquarters put a team in the field for the first time this season and were defeated by A.R.S.

MINIATURE RIFLE RANGE.—A match was shot between the Serjeants and the Corporals on June 21st. Scores:—

Serjeants.—Sjt. Higgott 87, S/M Henderson 78, S/M Newton 69, Sjt. Cundell 66, Sjt. Delaney 65, F/Sjt. Lisseman 64, F/Sjt. Buckby 62, Sjt. Bradburn 51. Total 542. Points, 54.

Corporals.—Cpl. Fitzgerald 70, Cpl. Jameson 68, Cpl. Reid 66, Cpl. Saunders 62, Cpl. Best 55, Cpl. Hathway 51, Cpl. Ellison 40, Cpl. Hamlyn 31. Total 445. Points 44.

Rapid Fire (plate shooting; 4 teams of 4 each). Serjeants 18 points, Corporals Nil.

Collective fire practices (landscape targets). Serjeants 11 points, Corporals 4.

The Corporals' Team lost the match by 35 points.

There was a competition on Friday morning open to members of visiting athletic teams. The prize (two tickets for the Pageant at Hendon), was won by L/A/C Preston, M.T.R.D., Harlescott, with a score of 81. There were over 100 entrants.

*Photograph by T. B. Latchmore and Sons, Hitchin.*

THE R.A.F. ATHLETIC CHAMPIONSHIPS.—Parade of the Teams from various Stations.

DO NOT FORGET THE R.A.F. PAGEANT ON JULY 2nd.

Dances.—There was a thoroughly enjoyable dance given by the Serjts.' Mess on Wednesday night. Our Depot Orchestra played and likewise provided the music for two Airmen's dances in No. 72 Shed on Thursday and Friday. At each of these there were over 600 present. The officers' Mess gave a dance also on Friday night.

Personal.—Flt. Lieut. C. E. H. Medhurst, O.B.E., M.C., left us on Monday for two months' course at Chisledon. On Tuesday Serjt.-Major O'Neill was discharged to the Reserve on completion of 18 years' colour service with the Royal Artillery, R.F.C., and R.A.F. Sjt.-Maj. O'Neill goes to Major Vitty (an old I.A.A.D. Officer) at Scotland Yard. He will be sadly missed in A.R.S., whose interest he had very much at heart.

## Isle of Grain Sports.

The Sports day of the Marine Aircraft Experimental Establishment was June 15th. After praying all the previous three days and consulting the Grain weather prophets, we really must say "We had a fine day for it." It was a very creditable turnout, and the whole Station feels that thanks are due to Squdn. Ldr. G. Bentley Dacre, D.S.O., and the Sports Committee for the excellent management.

A splendid programme of music was rendered by the R.A.F. Grain Band under the able direction of L/A/C Waters. The airmen all say that the finest "event" of the day was the big tea provided for them on the "mess deck."

Prizes were distributed by the Hon. Mrs. A. G. Horsley Carr.

A/C Watts was very amusing as a clown, and for the knocking about he got well deserved the clown's prize. A very fine performance was put up by A/C Round, who gained the Commanding Officer's Challenge Cup and several first prizes.

After the Sports a dance was held on the green, which was suitably decorated. This was thoroughly enjoyed by all, the only thing wrong being the fact that the M.C. (Cpl. Dale) could not get rid of the programmes quickly enough. Everybody seemed very happy except No. 4 Squadron, which could only muster seven men for the Tug-of-War.

The chief events and the results are as follows :—

Veterans' Race.—1st, Flt./Sjt. Barnard; 2nd, F/O Standish; 3rd, F/O Morris.

100 Yd. H'dicap.—1st A/C Coulthard; 2nd, Flt./Sjt. Walters; 3rd, A/C Toach. (Time 11 sec.)

Sack Race.—1st, A/C Redford; 2nd, A/C Borland; 3rd, A/C Jones.

220 Yd. H'dicap.—1st, A/C Round; 2nd, A/C Toach; 3rd, A/C Faulkiner. (Time, 28 sec.)

Long Jump.—1st, A/C Round, 18 ft. 7½ in.; 2nd, Flt./Sjt. Walters, 18 ft. 6 in.

N.C.Os. H'dicap (100 Yds.).—1st, Flt./Sjt. Barnard; 2nd, Flt./Sjt. Walters; 3rd, S/M Kirk. (Time 11 sec.)

Officers H'dicap (100 Yds.).—1st, F/O Morris; 2nd, F/O Standish; 3rd, F/O Reedy.

Half-Mile H'dicap.—1st, Flt./Sjt. Strudwick; 2nd, Cpl. Cornwall; 3rd, A/C Goodings. (Time, 2 min. 7 sec.)

Three-Legged Race.—1st, Faulkiner and Round; 2nd, Cresswell and Pearce.

1 Mile Station Relay.—1st, No. 4 Sqdn.; 2nd, No. 1 Sqdn.

Band Race.—1st, A/C Foster; 2nd, Cpl. Blake; 3rd, A/C Gant.

High Jump.—1st, A/C Sey, 4 ft. 7½ in.; 2nd, A/C Walker, 4 ft. 7 in.

Mounted Wrestling.—1st, Frame and Stoddard; 2nd, Futcher and Webb.

100 Yd. Championship.—1st, A/C Round; 2nd, A/C Coulthard; 3rd, Cpl. Hands.

1-Mile Invitation Scratch.—1st, A/C Stenhouse; 2nd, A/C Edney; 3rd, Portgual; 5th, A/C Salmon; 5 min. 28.2 sec.

Tug-of-War (Station).—1st, No. 1 Sqdn.; 2nd, Officers.

Quarter-Mile H'dicap.—1st, Cpl. Cornwall; 2nd, Flt./Sjt. Strudwick; 3rd, F/O Standish. (Time, 47 3/5th sec.)

120 Yd. Hurdles.—1st, A/C Walker; 2nd, Flt.-Sjt. Walters; 3rd, A/C Pope. (Time, 19 sec.)

Tilting the Bucket.—1st, Frame and Stoddard; 2nd, Jackson and Devereux.

1-Mile Invitation Relay.—1st, R.A.F. Grain; 2nd, H.M.S. *Erebus*.

Obstacle Race.—1st, A/C Walker; 2nd, Sjt. Temple; 3rd, A/C Stoddard.

Blindfold Squad Drill.—Flt./Sjt. Bill's Squad.

## Sports and Pastimes at Hawkinge.

Until April this year No. 25 Squadron at Hawkinge has been only a Cadre. Recently it has been expanded to Squadron strength and hopes now to play its proper part.

Since the beginning of April, cricket has been the chief preoccupation, and at the moment the Inter-Flight Cricket Championships are in progress, there being five teams in the League. Of the nine fixtures arranged against neighbouring teams, the Squadron XI has won 3 and lost 3.

Two representatives were sent to R.A.F. Depôt, Halton, on May 16th for the R.A.F. Individual Boxing Championships, but they unfortunately did not meet with much success.

On May 27th a Sports Trials afternoon was held to discover the best times of the airmen who had been in training during the month and, as a result, on June 11th Cpl. Dean and A.C.2 Field represented the Squadron at Kenley in the No. 1 Group R.A.F. Sports, the latter winning his event—the Long Jump.

It is proposed to hold the Annual Athletic Sports Meeting on Wednesday, July 27th.

At present a boxing ring is being built and it is proposed to put it to good use when completed.

Airmen's Dances are held on alternate Wednesdays and these are always well patronised. The music at present is provided by a pianist and violinist, but it is hoped that a band of sorts will be raised before long.

## "Test" Form at Donibristle.

On a bowler's wicket on June 25th Coastal Area Aircraft Depot, Donibristle, played the R.N. Base, Crombie, at Crombie. Donibristle batted first and made only 27 runs, but in spite of this poor total hope ran high when Crombie lost their first four wickets for three runs and were afterwards five wickets down for ten runs. At this stage Able Seaman Murphy came in and knocked off the eighteen runs required to win, and their innings closed for thirty-seven, Donibristle thus losing by ten runs after a very exciting match.

THE ISLE OF GRAIN SPORTS.—1. Tug-of-War; 2. -Mile Handicap; 3. Comic Fire Brigade; 4. General view of sports field, and 5. N.C.O.'s Race.

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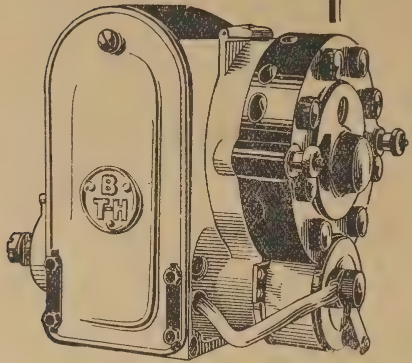

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# AERONAUTICAL ENGINEERING

## SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AIRCRAFT FINANCE AND COMMERCIAL AERONAUTICS AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER.

## THE WEEKLY COMMENTARY.

The report of the Committee appointed by the Royal Aeronautical Society to discuss technical questions relating to the safety and economical working of commercial aircraft is discussed in the article below.

It will be found that the Committee, although making no revolutionary recommendations, have dwelt upon the great importance of careful attention to the innumerable small but vital details which compose an aeroplane.

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A description of the present state, and of the activities, of those aircraft firms who inhabit the West of England, based on a tour by "C. G. G." in that district, appears in this issue. It will probably not greatly surprise regular readers of this journal, but they may find in it useful propagandistic material to use on those of their acquaintances who believe that the Aircraft Industry in this country is dead, or at least dormant.

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Of the many French firms which undertook the building of aeroplanes for the first time during the war there are now few survivors still engaged in the Aircraft Industry. Of these few the firm of Henri Potez appears to be one of the most energetic, and the description which appears hereafter of their more recent products will be found to be of interest.

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Mr. A. H. G. Fokker in a letter replies to certain criticisms made by "C. G. G." upon the flotational qualities of the Fokker commercial monoplanes.

## SAFETY AND ECONOMY.

The report of the committee which was recently appointed by the Royal Aeronautical Society "to discuss the question of the type of engine and mechanical arrangements, etc., required for the safe and economical working of an aeroplane carrying mails and passengers (a) between London and Paris, and (b) over a 500-mile route," was issued on June 13th.

The Committee consisted of the following gentlemen: Col. Mervyn O'Gorman, C.B., D.Sc., Chairman; Lt.-Col. W. A. Bristow, M.I.E.E., M.I.Aut.E. (Insurance); Lt.-Col. L. F. R. Fell, D.S.O., O.B.E. (Engine design); Capt. G. de Havilland, O.B.E., A.F.C. (Aeroplane design); Capt. G. T. R. Hill, M.C., B.Sc. (Piloting); Wing Comm. J. H. A. Landon, D.S.O., O.B.E., (Engine installation); Sqd.-Leader G. H. Norman (Testing); Mr. H. Ricardo, A.M.I.C.E., M.I.Aut.E., (Engine research); Mr. A. J. Rowledge, A.M.I.Mech.E., M.I.Aut.E. (Engine design); Col. F. Searle (Business management); and Mr. R. McKinnon Wood, A.M.I.C.E. (Aeroplane design).

Owing to the large number of considerations to be taken into account in regard to the specific London-Paris route, and the colossal number which might be entailed in the discussion of conditions on any possible 500 mile route, due to various climatic and geographical conditions which might be encountered, the Committee decided to deal only with the London-Paris case, particularly as it was felt that the value of the report would be enhanced by early publication.

The report of the Committee has been arranged in the order of discussion of the various points, which was adopted to agree with their approximate relative importance, and is divided into four sections: (A) Installation work, engines, oil and petrol systems; (B) Engine design; (C) Aeroplane design; and (D) General.

The report consists of 41 definite recommendations, with few of which anyone can seriously quarrel, interspersed with explanatory remarks.

### ENGINE INSTALLATION.

Opening Section (A) is to be found the following: "It became clear that failures in the engine itself as compared with a group of effects which may be described as 'faulty installation' . . . . formed a small percentage of the causes of forced landings. The present day aero-engine may be called reliable in contrast with those other items."

This fact has been clearly insisted upon in this paper, and it is to be hoped that this weighty confirmation of that view will somewhat reduce the flow of abuse which is so often poured upon the unfortunate petrol engine.

The first item specifically mentioned as a cause of engine failure is lack of cleanliness. The statement made is: "A potent cause of breakdown, owing to its interference with inspection of pipes, carburetter, ignition system, etc., is the discharge of oil from breathers, leaks, bearings, etc. . . . . This detail was proved to be serious, and it is recommended that:—

1. All oil leakage and spray should be eliminated."

One cannot too heartily acquiesce in this recommendation. Cleanliness about an engine is usually regarded as a minor matter, and there are many engine installations which are allowed to operate in such a condition of filth that inspection is not only unpleasant, but almost impossible. Long experience with machinery of every kind has conclusively shown that it is very difficult to get mechanics or engineers to take any pride in the maintenance of plant which is not kept clean, and plant which cannot be kept clean can scarcely hope to be carefully tended.

Recommendation No. 4 is as follows:—"Urgent efforts should be made to produce a satisfactory distance-reading petrol gauge. . . . ." In cases where a gauge can be directly attached to a tank and remain in sight it is suggested that such a gauge be made compulsory.

Recommendations 5 and 6 are directly interrelated. The fifth is that rubber connections in petrol systems be discouraged, and the sixth that soft steel pipes should replace copper for both petrol and oil.

Other recommendations in this section are that the pressure fed petrol system should be allowed as well as gravity and pump feed; that an adequate and accessible petrol filter be a permanent item in the fuel system; that engine cowling should be improved as to ease of removal and replacement, and that on removal complete access be given to engine and its accessories; that magnetoes be readily removable and easily replaced correctly; that dual ignition should be invariable; that the rule for computing radiator area, on the basis of definite area per h.p. be abandoned; and that every possible step be taken to render airscrew swinging unnecessary by the use of proper starting appliances.

### ENGINE DESIGN.

Under Section (B), Engine Design, it is recommended that:—

> "12. A test consisting of a number of consecutive periods of, say, 2½ hours each, with a strict adherence to schedule time for each start, and with one working hour interval between each, should be introduced into the existing 50 hour type test for engines; moreover, a full test should be made of the complete power-plant and accessories as installed in the aeroplane in a trial flight."

This recommendation obviously covers two entirely separate tests, the one a test for each specific type engine, and the second one for each specific type of engine installation—i.e., for each separate type of aeroplane. The addition of the broken runs to the ordinary endurance test of a new engine is probably desirable, and should certainly be tried.

The test of the complete installation in flight in an aeroplane is surely in some sense invariable—for any test flight is such a test. The Committee would have performed a useful service had they suggested a definite form for the flying engine test, instead of merely stating that such a test was necessary.

Under the heading "Starting up" the wasteful nature of the practice of "warming up" is commented on, and the opinion is hazarded that this practice is largely the result of habit, and that the danger of opening an engine up when cold is largely a matter of faulty oil gauges. This opinion seems questionable, but the following recommendation is undoubtedly sound :—

> "13. Engines should be so designed and arranged to open up to full throttle within a few minutes of starting."

It is ridiculous that one should have to waste enough petrol to carry a machine 10 to 20 miles merely to warm up a gallon or two of oil.

The very great importance of reliability on the part of valve springs is mentioned, and it is recommended that—

> "17. Research is desirable on the manufacture of springs, in order to bring mechanical differences within small and reliable limits of variation."

### The Speed of Airscrews.

The Committee considered the question of the speed of airscrews, and in view of the superior efficiency of a low-speed screw, and considering the practical limits to increase of airscrew diameter, they put forward for consideration :—

> "18. For commercial purposes and specifically with a view to a steep angle of climb in getting off, engine design should provide for a slow speed of revolution of the airscrew, not exceeding, say, 800 to 1,000 per minute for an engine of 500 or 600 h.p. when flying all out."

This is a point of very considerable importance, and it is to be regretted that, in the present state of the aero-engine industry, it is unlikely that any large number of engines will be produced to meet this recommendation in the near future. Temptations to an engine designer to run crankshaft speeds up to the neighbourhood of 2,000 r.p.m. are very strong, and not particularly likely to be resisted, for the recommendation can scarcely be met without the use of a reduction gear, and reduction gears of large ratio present difficulties of design. It is to be remembered that it is practically impossible to settle a standard speed for engines of given power which will suit all cases, and therefore it seems desirable that engines shall be designed with alternative and interchangeable gear-boxes, so that a standard engine, fitted with one of a number of alternative gear ratios, will suit almost any class of machine which calls for that particular power output.

Probably the maximum number of gear ratios needed would be three—one for low-speed cargo carriers, one for heavily loaded passenger and mail machines, and one for lightly loaded high-speed machines for express mail or war purposes.

### Standardised Engine Mountings

On the subject of repairs the Committee report that they had under consideration suggestions made by Capt. Barnwell and by Col. Fell. The former suggested standardising the provision made for fixing the engine to the fuselage, and the latter the making of the forepart of the aeroplane detachable as a unit. The Committee felt that the time was not yet ripe for fixing standards of the first type on the ground that engine development took much longer than that of an aeroplane, and the aeroplane designer would be unable to supply the engine designer with sufficient information as to his future requirements, and that hence there is a risk of cramping the development of aeroplane design. At the same time they believe that much can be done by foresight in design to make engines readily removable, and they recommend that :—

> "19. The attention of designers should be drawn to the desirability of so fixing the engine installation (comprising if possible carburetter, ignition cooling and oiling systems) that it is easily removable as a unit."

In this respect the Committee seems to have suffered from an unnecessary timidity.

To have attempted to lay down standards applicable to all types of engines, so that engine installations of approximately equal power should all be interchangeable regardless of the particular make or type of engine, would undoubtedly be unwise. But there does not seem to be any serious difficulty involved in asking engine makers to design for their own engines a standard installation with standardised fixings, to be bolted to the end bulkhead of the fuselage. To all intents and purposes this has already been done by the designers of rotary engines, and no serious difficulties of the type envisaged by the Committee have been found. Such minor inconveniences as are met with in regard to the design of cowling and of fuselage end are more than offset by the ease with which a rotary engine unit may be removed or replaced.

Any such standard attachment must obviously be designed so that the fixing points do not fall outside the dimensions of the smallest fuselage or nacelle which would be likely to follow that particular engine. There is then no insuperable difficulty in arranging attachment to the end of any larger body. Such an attachment probably means a little added weight—just as the engine-plate and mountings of a rotary are usually slightly heavier than they might be if the whole engine mounting were re-designed for each case, but the saving in time and trouble of replacement, together with the simplification of the installation problems which now arise afresh in every new type of aeroplane would amply compensate for this trouble.

There need be no compulsion in the matter, for if any engine designer will take the trouble merely to design such an installation, test it, and make certain that it is satisfactory and will then present every purchaser of his engine with the drawings, together with a quotation for the complete installation, he will probably find that aeroplane designers will be delighted to have a great burden removed from their minds, and that their engines will rarely suffer from unsatisfactory installation.

The matter is essentially one for the engine makers. If they themselves will tackle it in the right way they can greatly assist the aeroplane designer, and at the same time add to their own reputations.

### Central versus Wing Engines.

As to power plant arrangement, for the specific case of the London-Paris service the Committee came to a conclusion in favour of single-engined machines. They took an imaginary machine, answering fairly closely to the capacity of a D.H.18, as a desirable type and recommended that :—

> "20. The thrust should be central, whether one or more engines be used"; and
>
> "21. At or about this size of aeroplane a single engine is preferable to two coupled together."

This latter recommendation is based on the non-existence of a proved variable pitch airscrew. With one screw driven by coupled engines, the failure of one engine will lead to overloading of the remaining one, a drop in engine speed and a power available of only about one-third of that developed by the two.

As a complement to these recommendations No. 22 suggests the desirability of inducing engine designers to strive after increased life in their engines.

Recommendation 23 is to the effect that with a single engine the provision of an engine-room is not worth while. Presumably engine-room means facilities for inspection and attention in flight. Finally, in regard to engine installations, the Committee make the recommendation :—

> "24. A desirable type of machine would be one equipped with two engines, in such a manner that in the case of one cutting out there would be no interference with the other and no additional turning tendency of the aeroplane to be counteracted, and that level flight would be maintained."

A note appended to this recommendation indicates that an arrangement of concentric airscrews driven each by a separate engine was considered. This arrangement involves either special engines or special gears, but has undoubted advantages.

This completes sections A and B dealing with engines and engine installations. Except in the matter of the final recommendation it will be seen that the Committee, very wisely have not sought for any drastic change in existing practice as a means to safety. They have realised that reliability is a matter of attention to detail, both in design and in installation. They have emphasised the importance of certain specific details, few of them particularly novel, but some of them not always treated with proper respect, and they have thus once more insisted, with all the weight of their authority, upon the fact that continual care and forethought alone will give that degree of safety and of reliability which is needed, and that there are no royal roads or short cuts to safety in the air.

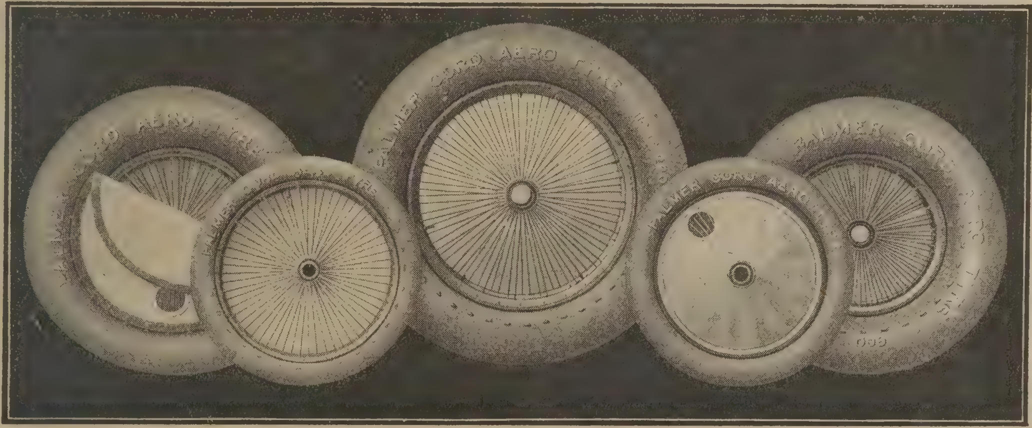
*(To be continued.)*

## AMERICAN BOMBING TESTS.

It is reported that a start has been made with the American test of bombs used against ships of war. On Tuesday, June 14th, three seaplanes bombed and sank ex-German submarine U.117 off Virginia Capes. The operation is stated to have taken sixteen minutes, though there is no indication as to how the said interval was occupied. If it was 16 minutes of continued bombing there does not seem to be a great deal to write, let alone to cable, home about, this country being the home of submarine bombing.

# PALMER

# LANDING WHEELS & TYRES



## STANDARD SIZES

| Tyre Size | Wheel No. | Hub |  | Track Line |
|---|---|---|---|---|
|  |  | Length | Bore |  |
|  |  | m/m | m/m | m/m |
| 300×60 | 16 | 111.12 | 25.4 | Central |
| ,, | 17 | 72.39 | 12.7 | Central |
| 450×60 | 30 | 89. | 31.75 | Central |
| ,, | 138 | 130. | 38.09 | Central |
| 575×60 | 21 | 160. | 28. | Central |
| ,, | 34 | 150. | 31.75 | 104/46 |
| ,, | 111 | 150. | 38.09 | 104/46 |
| 600×75 | 21 | 160. | 28. | Central |
| ,, | 34 | 150. | 31.75 | 104/46 |
| ,, | 111 | 150. | 38.09 | 104/46 |
| 700×75 | 78 | 178. | 44.45 | 132/46 |
| ,, | 79 | 178. | 44.45 | Central |
| ,, | 100 | 178. | 38.09 | 132/46 |
| ,, | 101 | 178. | 31.75 | 132/46 |
| 700×100 | 77 | 178. | 44.45 | 132/46 |
| ,, | 92 | 185. | 55. | 135/50 |
| ,, | 95 | 185. | 55. | Central |
| 700×100 | 96 | 178. | 55. | 132/46 |
| ,, | 99 | 178. | 38.89 | 132/46 |
| ,, | 112 | 150. | 38.09 | Central |
| 650×125 | 119 | 178. | 55. | 132/46 |
| 750×125 | 77 | 178. | 44.45 | 132/46 |
| ,, | 92 | 185. | 55. | 135/50 |
| ,, | 95 | 185. | 55. | Central |
| ,, | 96 | 178. | 55. | 132/46 |
| ,, | 99 | 178. | 38.89 | 132/46 |
| ,, | 112 | 150. | 38.09 | Central |
| 800×150 | 82 | 185. | 55. | 135/50 |
| ,, | 85 | 185. | 55. | Central |
| ,, | 40 | 185. | 60.32 | 135/50 |
| ,, | 152 | 185. | 66.67 | 135/50 |
| 1000×150 | 131 | 220. | 66.67 | Central |
| ,, | 102 | 185. | 55. | 125/60 |
| ,, | 141 | 250. | 80. | Central |
| ,, | 201 | 185. | 60.32 | 125/60 |
| 1000×150 | 209 | 185. | 55. | Central |
| ,, | 210 | 185. | 60.32 | Central |
| 1000×180 | 148 | 220. | 80. | Central |
| ,, | 149 | 185. | 55. | Central |
| ,, | 155 | 220. | 66.67 | Central |
| 900×200 | 107 | 185. | 55. | Central |
| ,, | 108 | 185. | 55. | 125/60 |
| ,, | 128 | 220. | 66.67 | Central |
| ,, | 137 | 250. | 80. | Central |
| ,, | 202 | 185. | 60.32 | Central |
| 1100×220 | 134 | 220. | 66.67 | Central |
| ,, | 136 | 250. | 80. | Central |
| 1250×250 | 133 | 250. | 80. | Central |
| ,, | 154 | 304.8 | 101.6 | Central |
| 1500×300 | 115 | 304.8 | 101.6 | Central |
| ,, | 126 | 304.8 | 152.4 | Central |
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# ON A TOUR IN THE WEST COUNTRY.

BY C. G. GREY.

For various reasons connected with the working of this paper one has been unable since the war to visit a number of aircraft factories which one has long wished to see under the conditions of what Colonel O'Gorman wittily prophesied during the war would be "a devastating peace." Recently it became possible to pay a few such visits, and as the West Country has played such an important part in British aviation one decided to go there first. Consequently on a day Herself and oneself and the editorial Mercédès, naturalised British long before the war, departed Westward Ho!

### Yeovil's Enterprise.

Proceeding *via* Salisbury and many vile roads bordered by enough deserted camps to house the whole army of the Unemployed while rebuilding the said roads, we arrived at the ancient town of Yeovil, where some few years ago the enterprising firm of Petter, long famous for its excellent oil engines, opened an aircraft factory which soon became noted for the high quality of its work. This factory was run as an enterprise separate from the oil engine works and was placed under the charge of Mr. R. A. Bruce, at that time serving as an R.N.V.R. Inspector in the Air Department, Admiralty, and formerly a collaborator with the famous Mr. Brennan in his torpedo and monorail experiments. The aircraft shops were called the Westland Aircraft Works, and any R.A.F. officer can vouch for the staunchness and high finish of any machine bearing the Westland name.

The bulk of the firm's output was made to the designs of other firms, notably of Sopwith, Short, and de Havilland, but towards the end of the war the firm's own designs were approved and the Westland "Wagtail" and "Weasel" put up fine performances. Mr. Bruce was fortunate in finding in the oil-engine drawing office a designer, Mr. Davenport, who has not only engineering ability, but that natural eye for an aeroplane which is born in a man and cannot be acquired. Consequently the firm's first essay in designing commercial aeroplanes after the war resulted in the Westland "Limousine," with a "Falcon" Rolls-Royce engine, which is still one of the most beautiful as well as one of the most efficient machines in the World, a production of which Mr. Bruce and Mr. Davenport may well be proud.

The winning of the Air Ministry Competition by a bigger "Limousine" with a Napier "Lion" engine last year is a matter of history, but one of which it is well to remind a people which is notoriously afflicted with a short memory. To-day, doubtless thanks largely to the fact that Government subsidies made it possible to use obsolescent aeroplanes on air lines when it ought to be of vital importance to use the most modern aircraft, the Westland firm is less concerned with commercial aeroplanes than with war machines, though one replica of the Napier-engined "Limousine" is or will shortly be in use on the London-Paris service.

### An Official Effort.

One must not, of course, publish any details of the war machines on which the Westland Company are engaged, though doubtless they are sufficiently familiar to sky-gazers on certain parts of our coasts. But, for the benefit of those who use, or misuse, them one may at any rate explain that they are of official design. Hence the fact that they have not the beautiful lines of all real Westland machines.

In appearance they suggest a D.H.9a, which has been redesigned in collaboration by Admiral Sir Percy Scott and Mr. Heath Robinson, with addenda by Mr. Harry Tate and the White Knight (Alice's friend). One's R.A.F. friends suggest that after they have been delivered most of the official addenda are removed and that their performance then approximates to that which might be expected from machines from such makers and with such engines. At any rate one can vouch for the fact that they are magnificently made and beautifully finished, so that in workmanship they are quite worthy of the Westland reputation.

### A Happy Lot.

Mr. Petter and Mr. Bruce devoted much of their valuable time to showing us round the works. One envied the people who live under such ideal conditions, housed in a beautifully situated town and going to work in shops which are practically in the country amid the healthiest possible surroundings. It is not surprising that the men and women in the canteen at mealtimes look as if they were having a holiday picnic rather than as if they were in the middle of a day's work. One was inclined to ask some of them whether they know how well off they are compared with factory operatives in the big cities of the Midlands and North.

It was sad to see how badly the engine shops were affected by the coal strike and the consequent depression in trade, but there was much consolation to be derived from the contrast provided by the aeroplane shops. Here everybody was hard at it turning out 1921 type aeroplanes. One hopes ere long to learn that the aeroplane shops are equally busy on commercial aeroplanes.

Thereafter, by way of showing the lifting power of the firm's products, one of the smaller "Limousines" with a Rolls-Royce "Falcon" elevated a friend of Mr. Petter's who was taking her first flight and Herself and oneself and all of Mr. Keep for some distance into the atmosphere whence we could see both the English Channel and the Bristol Channel. It is difficult to say whether one admired more the absolute comfort of the machine or Mr. Keep's elegant and careful piloting. Certainly no railway-carriage or car could be as comfortable as the "Limousine," and it is considerably less noisy than any train.

As an example of the utility of this machine Mr. Bruce related how recently wishing to see the Armstrong-Siddeley people at Coventry about some engine work he did his morning's work in his office, flew to Coventry in time for lunch, went round the Siddeley works—of which, incidentally, he expressed the highest opinion—had tea there and flew back to Yeovil in time to sign his letters as usual. The journey could not have been done in less than two days by train, and to do it in one day by car it would have been necessary to leave in the very early morning and to come back very late at night. Here we see the beginning of real aero-taxi work when improved wings make it possible to carry paying-loads at low prices with small engines.

Altogether our visit to Yeovil was highly instructive as well as thoroughly enjoyable, and one expresses herewith one's indebtedness to Mr. Bruce and Mr. Petter.

### Parnall Enterprise.

From Yeovil the ancient Merc. took us over the Mendips to Bristol by roads at angles which would have stalled even the "Limousine." The Capital of the West Country was *en fête* for the visit of the Prince of Wales, but one was able to see a good deal of what is being done by both the Bristol Co. and George Parnall and Co.

Mr. George Parnall will go down in the history of aviation as the first British aeroplane constructor who had the faith and courage to start a factory for the manufacture of aircraft after the war. He had the judgment to secure Mr. Harold Bolas as his technical assistant, on the strength of the success of the Parnall "Panther," which was produced to Mr. Bolas' designs by Parnall and Sons—Mr. George Parnall's ancestral business—late in the war. Since then the new firm has turned out the Parnall "Puffin," a deck-flying amphibian which showed very great promise and seems well worth producing in such quantities as to give our Naval aviators a fair opportunity of proving its worth under Service conditions as distinct from technical tests.

The "Puffin" has been illustrated in this paper, but being a Service type it may not be described in detail. One can only say that Mr. Bolas has achieved considerable success in the difficult problem of making a machine small enough to be stored in a ship, big enough to carry two men with fuel for a long flight and with arms and ammunition for attack and defence, light enough to have a high performance, strong enough to stand battering on the sea and bumping on deck or land, stable enough to save the pilot from unnecessary fatigue, and controllable enough to be a good fighting machine.

At any rate, the "Puffin" is sufficiently appreciated in High Places for Mr. Parnall to be entrusted with the construction of certain other experimental machines of very great interest. It would be a pleasure to describe some of the details if one were permitted, if only for the sake of showing how cleverly Mr. Bolas has overcome difficulties of which the solution calls for the minds of an engineer and a champion jig-saw-puzzlist combined. But here again Service work must not be discussed, so one can only congratulate Mr. Parnall and Mr. Bolas on their success.

It is satisfactory to know that besides these interesting Service orders George Parnall and Co. have certain merely commercial work in hand which enables them to keep together a sufficient staff of skilled men to form a nucleus for a "full shop" whenever quantity-production orders come along. One hopes sincerely that such orders may soon arrive, for such virtues as the firm have already displayed deserve to be not their only reward.

### The Pioneer Firm.

The Bristol Aeroplane Co. Ltd., formerly the British and Colonial Aeroplane Co. Ltd. have the distinction of being the first firm in this country formed for the construction of aeroplanes on a commercial scale. The foundation of the firm was due to the foresight of the late Sir George White, Bart., who in 1909 believed as firmly in the future of air transport as he did in the future of electric traction in the days when most other people thought no further ahead than steam

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railways and horse trams. When he founded the Bristol Works he established the tradition that the best of everything might be just about good enough for Bristol aeroplanes. That tradition has been loyally upheld by his son, Sir Stanley White, and by his nephews Sir Henry White Smith and Mr. Herbert Thomas. Consequently to-day as throughout the war the Bristol aeroplane embodies everything that is best in design and construction.

The main works were closed when one visited Filton, all hands having gone off to pay their loyal respects to the Prince of Wales, who certainly received a thorough West Country welcome. But one found certain officials of the firm still at work in the experimental shops at the aerodrome, where Mr. Studdy and Mr. Uwins showed us the big Napier-engined ten-seater about which there has been so much speculative talk wherever aviators most do congregate. As a matter of fact the machine, which has been designed by Mr. Reid, can be made equally well into a twelve-seater and looks as if she could carry a few more at a pinch, for the cabin is the most commodious thing of its kind that one has seen. A properly illustrated and deailed description of this interesting machine will be published as soon as she has passed her tests.

Meantime one can only say that the pilot and one passenger (or a wireless operator) sit in front of the main planes and have a very good view forward and downward. The undercarriage is of the four-wheeled type, very similar to the "Braemar," which was also Mr. Reid's design. And, according to rumours from technical people in London, the wings are said to have the most evenly distributed stresses put upon them of any aeroplane ever produced. Altogether she is a very interesting example of commercial aeroplane design.

There was also in the shop a very big machine designed for experiments with geared airscrew drives and many engines. This has likewise been discussed in many places, but being a Service job must not be described. One may perhaps say that the Armstrong-Siddeley Company deserve to be complimented on having designed and produced some beautifully made gear mechanism for the machine. And, naturally, the workmanship in the aeroplane is fully up to Bristol standard.

### Captain Barnwell's Latest.

A particularly fascinating machine in this shop was the cut-down Bristol "Bullet," designed and lately re-designed by Capt. Frank Barnwell. In its original form it put up a very creditable performance in last years' Aerial Derby when Mr. Uwins completed the course in very good time, keeping his experimental "Jupiter" engine well in hand. For this year the surface has been decreased, the fuselage altered, and an improved "Jupiter" fitted. She comes fairly near Captain Barnwell's expressed desire for the biggest possible engine with the smallest possible aeroplane built round it. Without having any idea of her performance as altered and judging purely on her good looks she seems worth backing by anybody who is not plunging on any one other machine.

After visiting the aerodrome one had much elevating and instructive conversation with Capt. Barnwell and Mr. Reid in the design office, which department is deeply involved in aerodynamic experiment as well as in the more straightforward work of designing aeroplanes. The Bristol Co. is as determined as ever to hold its place in the front rank of aeronautical progress and is not content to maintain its reputation by workmanship alone.

One gathered during one's visit that the main works are quite reasonably busy on orders for the R.A.F. and elsewhere. The Bristol "Fighter" has always been a favourite with R.A.F. pilots and the 1921 type "Fighter," improved in all sorts of details, major and minor, is as beautiful to behold and as beloved by pilots as was its progenitor which did so much to win the Command of the Air for the R.F.C. in 1917.

### The Bristol Engines.

Later we paid a visit to the new engine shops, also on the aerodrome, where Mr. Roy Fedden, assisted by Mr. Stammers and Mr. Butler, is producing that excellent radial engine which started life as the "Cosmos." The Bristol "Jupiter" retains the chief characteristics of the original, but has been re-designed in detail. Its recent bench-tests have been highly satisfactory, and it promises to be a very great engine for fighting scouts and similar high-performance machines of the near future.

The new engine-test shed and the workshops are all that Bristol shops should be, and the work which is being put into the engine is up to the quality of that in the Bristol aeroplanes. One can think of no higher standard. The engine works are absolutely self-contained, even to having their own gas-plant for the hardening furnaces.

While here one had a highly interesting talk with Mr. Fedden, who has very decided views on the difference between war engines and commercial engines, with which views one cordially agrees. Stated briefly, the argument is that though in a war engine it may pay to spend £1 in saving 1 oz., either by expensive machining or by using the costliest material, no sort of commercial air transport can stand the expense of buying engines built on war principles. That is to say, commercial aero-engines must be designed for their own particular jobs in order to save overhead or capital charges on air lines. One commends this view particularly to the Department of Civil Aviation and to prospective organisers of air lines.

### Busy Cheltenham.

From Bristol we journeyed to Cheltenham with the intention of interviewing Mr. Longden of the Gloucestershire Aviation Co. Ltd. Mr. Longden is a very busy man, so busy that it is quite difficult to establish communication with him from this office. After visiting his firm one understands this better, for he was away and one could discover nobody else who would discuss anything about aircraft, therefore one had to be content with viewing the shops from their respective doorways.

The Gloucestershire Aviation Co. is seemingly closely allied with the firm of H. H. Martin, seeing that they occupy the same offices and have their brass plates on the same doorpost. On entering the works enclosure one was faced by two Bessonneau portable aeroplane sheds, one of which was closed, the open front of the other showing it to be occupied apparently by petrified soldiers in attitudes of offence. On closer inspection these proved to be statues of considerable executive merit, probably designed for monumental purposes.

Alongside the Bessonneaux were a range of solid brick and iron buildings which would, and probably did at one time, make excellent aeroplane workshops. The first bay of these seemed full of engineless Nieuport "Nighthawks," which are apparently the raw material from which Mr. H. P. Folland is producing "Sparrowhawks" with B.R.2 engines for the Japanese Navy. As there did not appear to be much human activity here one assumed that the machines were waiting for engines.

One judges that these should be excellent fighting machines, probably somewhat superior to the "Snipe," in the hands of competent pilots. But if what one hears of Japanese pilots is true any really high-speed aeroplane is likely to contribute materially to the casualty list of the Japanese Navy. Perhaps, however, the ingenious Mr. Folland can combine the performance of the "Snipe" with the more soothing qualities of the B.E.2c in his transmogrified "Sparrowhawks."

Near to the aeroplane bay was another very busily occupied by a number of obviously skilled workmen chipping away with mallet and chisel at large blocks of stone, but whether for monuments of a celebrative or necrological nature one could not ascertain. The juxtaposition of ideas, however, obliged one to imagine that the works were in the happy position of being able to supply their Japanese customers with goods of the two classes which are likely to be in the strongest demand owing to Japan's ambitions in the direction of Air Power.

Yet another bay was well filled with a large number of small and neat automobiles fitted with coupé bodies in various stages of incompletion. In the present state of the automobile trade one could quite understand that this section did not appear as a hive of industry. Again another bay was occupied by plaster work, either models or casts, which tempted one's artistic soul to creep in and look. But having failed

**FOR SNOWCLAD COUNTRIES.**—The accompanying photograph shows one of the now well-known Junkers limousine six-seaters, equipped with ski undercarriage. It is understood that certain machines of this type, and thus fitted, are now in the service of the Imperial Petroleum Company in Canada, and are thus the first German-built aircraft to fly under British registration numbers.

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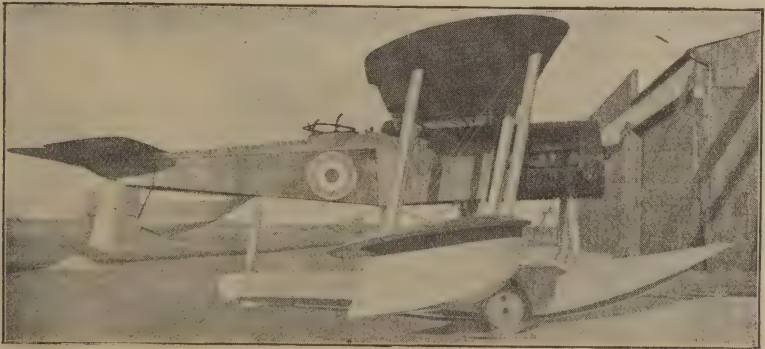

THE
PARNALL
"PUFFIN."
A Deck-Flying
Amphibian Biplane.

This machine, here seen in side view, is an example of Parnall Design and Construction.

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to attract the attention of anyone in authority one had to play the part of the penniless little boy outside the bunshop. Across the yard was another big shop occupied by immobilised automobiles. And that is all the information one can give one's expectant readers about the Gloucestershire Aviation Co. If at any time the busy Mr. Longden wishes the firm to become better known in the World of Aeronautics the pages of The Aeroplane are always very much at his service.

### A Glimpse at the C.F.S.

From Cheltenham over many more hills we progressed *via* Cirencester, the Town of Highworth, the Village of Swindon, and the School of Marlborough, to a place called Upavon, where is situated the Central Flying School, R.A.F., where once a certain Major Hugh Trenchard was Assistant Commandant. It is now the place where super-instructors instruct younger instructors how to instruct. Also it seems that some success has been achieved in the instruction of hens in their oviparous duties.

One had not been there since the new Mess, with its beautiful rubber floor, was opened in 1916. It was interesting to see that the old wooden Mess, sacred to the memories of the late Major Fulton and many another good man gone West still exists. Also the officers still live in the little wooden huts of 1912. The men, however, have good brick or concrete quarters dating from 1916 or thereabouts. Which is as it should be.

Apparently the Works and Buildings Department, Air Ministry, being cumbered with much serving at Cranwell and Halton, have forgotten the existence of the C.F.S. Which does not in the least matter, for the C.F.S. is what the Navy would call a "happy ship." Everybody is on good terms with everybody else. They all hold their C.O. in the highest esteem. There is plenty of flying and plenty of work and plenty of sport, so what more can the heart of aviator desire? Altogether the C.F.S. is a great place, and perhaps if one is good one may be allowed to go there again.

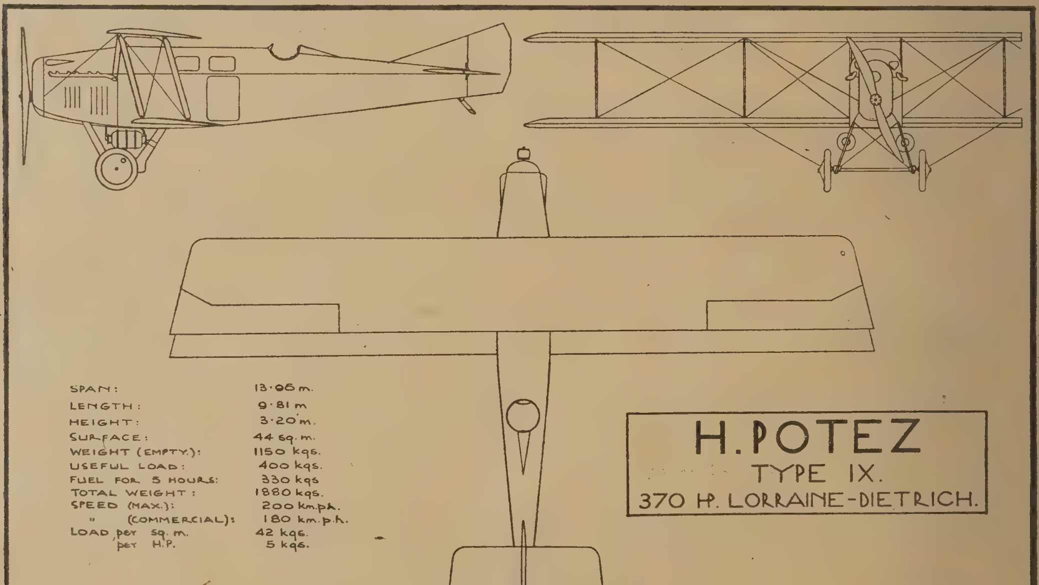
Meantime keep your eye on the C.F.S. Team in the R.A.F. Pageant.

### Back to Work.

And so home, as Mr. Pepys says, calling on the way on a certain C. R. Fairey in the bosom of his family, where one found a fierce atheletic competition in progress between the said C.R.F., a young and energetic soldier-man fra' Glesga," an Anglo-French designer-constructor-engineer who built aircraft in 1908 and became an R.N.V.R.-cum-R.N.A.S. officer during the war and one of the old original R.F.C. (Naval Wing)-cum-R.N.A.S.-cum-R.N.-cum-R.A.F. officers of the 1912 vintage. And despite his age and domestic responsibilities the R.N. officer was the best man of the bunch.

Truly it was an enjoyable and most instructive tour. Also it was most encouraging to find so much progress and work and cheerfulness in the Aircraft Industry amid the prevailing gloom. One would like to do such tours often towards the various points of the compass. But somehow three days' absence from this office seems to accumulate three weeks' work. Still it is worth while when one meets with all the kindness and hospitality which one met on this journey. Many thanks to everybody.—C. G. G.

## SOME NEW H. POTEZ AEROPLANES.



Two new types of aeroplanes have recently emanated from the works of Henry Potez at Levallois-Perret, and are known as Types VIII.R and IX. They are, in fact, improvements of previous Types VIII and VII respectively, both of which were exhibited at the 1919-20 Paris Aero Show.

The Type VIII.R, which is a modification of the Type VIII, is a small two-seater sporting aeroplane. The Type VIII will be remembered as having a 50-h.p. Potez 4-cylinder engine of car-type set at right angles to the line of flight, and driving the airscrew through bevel gearing In the VIII.R, an 80-h.p. Le Rhone engine has been substituted. This naturally broadens the fuselage, with the result that the seats have been placed side by side, making the machine more of a social type.

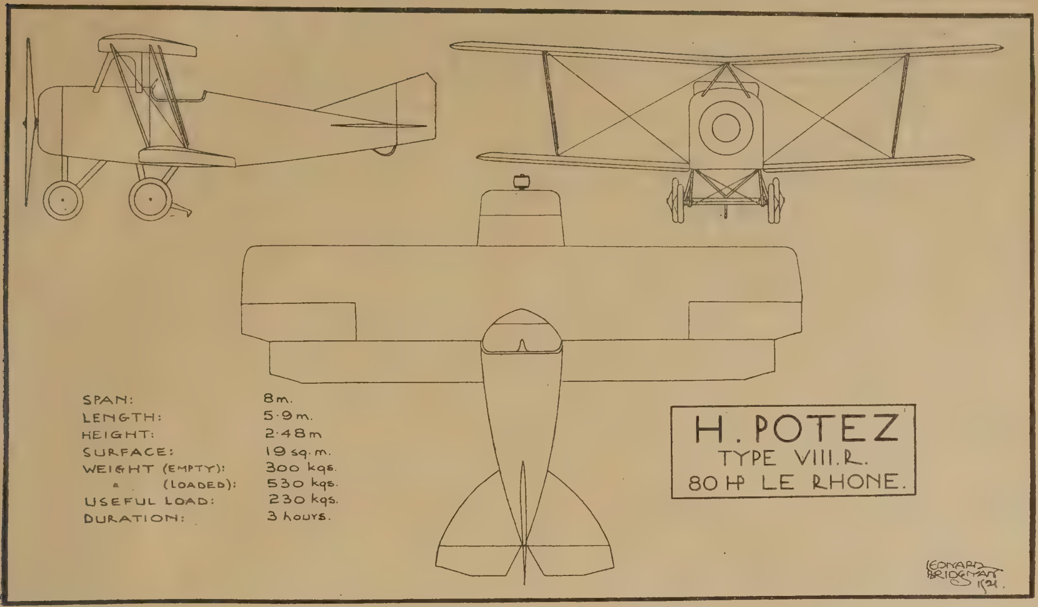
As regards construction, the wings and tail unit are of duralumin, fabric covered. The fuselage is built up of wooden longerons, covered with three-ply. The undercarriage remains the same as in the Type VIII, the arrangement of which can be seen quite clearly in the scale drawings.

The Type IX is an improved Type VII, which will be remembered as being a civil version of the S.E.A. type 4C.2 two-seater high-speed bomber-fighter.

The construction, mainly of wood, remains the same, but the fuselage has been widened to take 4 passengers, in two groups of two sitting side by side. The lines of the fuselage have been carried high so as to absorb the cabin, and the pilot has been placed well aft in a position similar to that found in the D.H.18 and Bat F.K.26.

The cabin is decidedly roomy. Cross-bracing has been eliminated with the exception of a movable duralumin tube which is placed in position, between the two sets of armchairs, during flight. A large emergency exist is situated in the roof well clear of the top plane. The engine, a 370-h.p. Lorraine-Dietrich, is cowled right in, cooling being carried out by two Lamblin radiators mounted, one on either side, between the legs of the undercarriage vees.

Large numbers of this type have been ordered by the Cie.



Franco-Roumanie for their Paris-Strasbourg-Prague-Warsaw service. With the deliveries expected this month, their fleet will be brought up to 70.

In addition to the above types, the Service Technique de l'Aéronautique has ordered a three-engined commercial machine for use in the colonies. This machine, known as Type X, is constructed entirely of duralumin, with the exception of the passenger cabin, which is of three-ply.

The principal dimensions of this type are :—

Span, 18.40 m.; Length, 12.70 m.; Height, 4.3 m.; Surface, 94 sq. m.; Weight (empty), 1,800 kg.; Weight (loaded), 3,090 kg. Engines, three 140-h.p. Hispano-Suiza; Estimated speed, 160 km.p.h.

A Type X-bis is the same as type X, except that it is fitted with three 300-h.p. Hispano-Suiza engines, which raises the estimated speed to 200 km.p.h.

The military machines, at present being developed by H. Potez, are Type X.B.p2, a two-seater long-distance bomber fitted with three 300-h.p. Hispano-Suiza engines, to be capable of flying for six hours at 205 km.p.h.; Type XI, a two-seater all-metal fighter to be fitted with a turbo-compressor, and Type XII, a single-seater fighter to be fitted with a 370-h.p. Lorraine-Dietrich engine.—L. B.

## MR. FOKKER'S VIEWS.

The following letter has been received :—

June 11th, 1921.

Sir,—After having read your article in THE AEROPLANE of May 11th, criticising the Fokker F.III, and Mr. R. E. Duke's answer published in Aeronautical Engineering of May 25th, I should like to say a few words on the different points under discussion.

I quite understand that the disposition of the pilot's cockpit at one side of the engine has caused a good deal of comment which is always the case with things uncommon. When discussing a new Fokker, however, you should not entirely forget that—besides being my own constructor—I have been my own test pilot from the very beginning, and that I still do all the test-flying myself. You may rely on it that I would not start manufacturing a new type without being convinced that it is quite good in every respect.

Same as Mr. Duke, the other pilots of the K.L.M. at first had a certain dislike to sit by the side of the engine, and to be placed so far forward in the machine, but after having flown the F.III for some time, they are perfectly satisfied with the new arrangement. They also find the visibility most excellent.

Straight ahead and downward, the directions in which the pilot has to look out during 99 per cent. of the time of flight, is in fact better than in any other machine. To the right and to the left, it is at least equal and upwards it is quite good. The vision rearwards is only possible on one side same as in a motor car, but there is absolutely no necessity for the pilot of a commercial aeroplane to look backward over the tail of his machine.

The tank which is of very solid construction is fitted between the big main spars of the wing. There is no other location in the whole aeroplane where the tank would be equally well protected.

So far, buyers of the F. III have not expressed the wish to have emergency exits which can be easily provided if required. As a matter of fact, the following type Fokker IV and the F. III of a new series has them already.

In case of a forced landing on the water it is most likely that the machine will be turned over and float on its back, with the cabin and tail out the water. Mr. Duke has already mentioned that the plane is absolutely watertight and floats indefinitely.

The fuselage bracing as it is has been passed by the German authorities in thousands of Fokker war planes, and has proved quite equal to all demands of hard front wear, so that the question of reliability may be regarded as settled.

(Signed) A. H. G. FOKKER.

## THE MASTER OF SEMPILL.

Colonel the Master of Sempill left this country for Japan on June 11th, 1921, and will be away some time in connection with work for the Imperial Japanese Naval Air Service.

All letters should be addressed :—Colonel the Master of Sempill, c/o Naval Department, Tokyo, Japan.

Cables should be sent in Bentley's code :—Sempill, Kaigunsho, Tokyo.

Any essential personal business will be attended to by Commander Smart, C.M.G. (late R.N.), c/o Messrs. Jensen, Cobb, Pearson and Co., 22, College Hill, London, E.C.4.

## AUTOMOBILE ENGINEERS AT FARNBOROUGH.

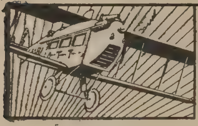
The projected summer visit of the Institution of Automobile Engineers to Birmingham having been abandoned owing to the fact that in the present state of business many of the concerns in that district felt that they would have little to show to the visitors, a series of visits in the neighbourhood of London have been arranged instead.

On Tuesday, June 14th, a "K" type A.E.G. 'bus conveyed a party to the Royal Aircraft Establishment at Farnborough, where starting devices for aeroplane engines, an exhaust turbine supercharger and other interesting items were seen.

It is amusing to see that in default of motor business these automobile experts are again beginning to take an interest in the erstwhile despised aircraft.

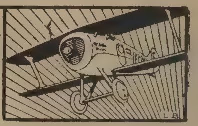
## TIMBER WANTED.

If anybody in the Aircraft Industry knows of any stocks of aircraft timber to be sold cheap for cash the editor of this paper will be glad to have particulars. The quality need not be up to the highest standard as it is not to be used for aeroplane work. The grade of stuff which was passed under stress of circumstances for use in late war-time aeroplanes will be good enough. Anybody who has such timber for sale can be put in touch with a likely purchaser.—C. G. G.



# COMMERCIAL AERONAUTICS

## AND CIVIL AERIAL TRANSPORT.



# THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND.

## OFFICIAL NOTICES.

### FRANCE—MOROCCO AIR MAIL SERVICE.

CHANGES.

The Postmaster-General announces that the Air Mail for Morocco (Service No. 5 in the Post Office Air Mail Leaflet) now leaves Toulouse at 10.30 a.m on Tuesdays, Wednesday, Fridays and Sundays. The latest time of posting at the General Post Office, London, is 6.30 a.m. (6.0 a.m. for printed papers) on Mondays, Tuesdays, Thursdays and Saturdays.

## CONTINENTAL ARRIVALS AND DEPARTURES.

*[The following table of arrivals at and departures from the British Air Ports is compiled on the following system:—First comes the initials of the Air Line; next the type of machine; next the international number of the machine; next the ports of departure and destination; next the times of departure and arrival; next the cargo, whether goods (G) and/or mails (M); next the number of passengers; and finally the name of the pilot and number of mechanics, if any.]*

ABBREVIATIONS:—A.D.—Aireraft Disposal Co. B.A.—Berkshire Aviation Company. B.C.—Bristol Aeroplane Company. B.M.—Brompton Motor Company. C.A.—Dept. of Civil Aviation. D.H.—De Havilland Aircraft Co. G.E.—Compagnie des Grands Express Aeriens. H.P.—Handley Page Transport Ltd. I.L.—Instone Air Line. K.L.—Koninklijke Luchtvaart Maatschappij. L.A.—Leatherhead Aviation Services. M.A.—Messageries Aeriennes. M.W.—Marconi Wireless Telegraph Co. Ltd. P.O.—Privately owned. P.L.—Petters Ltd. S.F.—Surrey Flying Services. S.N.—Syndicat National pour l'Etude des Transports Aeriens (S.N.E.T.A.).

## The London Terminal Aerodrome, Croydon. (Telephone: Purley 1180.)

### JUNE 20th:

K.L., Fokker, H-NABM, London-A'dam, 10.00-13.34, G.M., 1, Olley.
M.A., Breguet, F-CMAR, London-Paris, 10.18-12.45, Nil, 3, Robyn.
I.L., Vimy, G-EASI, London-Paris, 10.25-13.00, G.M., 9, Chattaway.
G.E., Goliath, F-GEAC, London-Paris, 12.47-15.25, G.M., 10, Favreau & 1
S.N., DH9, O-BELG, London-Brussels, 13.00-15.10, M., 2, Catta.
S.N., DH9, O-BATA, London-Brussels, 13.06-15.11, G., 1, Grandjean.
M.A., Spad, F-ACMA, London-Paris, 16.00-18.30, G., 3, Perignon.
H.P., HP, G-EATM, Paris-London, 11.20-14.47, Nil, 4, Wilcockson & 1.
I.L., DH18, G-EAWO, Paris-London, 12.20-15.05, G., 5, Robins.
M.A., Breguet, F-CMAM, Paris-London, 12.30-15.45, G.M., 2, Delage.
G.E., Goliath, F-FHMU, Paris-London, 12.45-15.47, G., 5, Gaston & 1.
S.N., DH4, O-BARI, Brussels-London, 12.51-15.34, G.M., 1, Van Opstal.
K.L., Fokker, H-NABJ, A'dam-London, 14.23-18.10, G.M., Nil, Holmes.
I.A., Vimy, G-EASI, Paris-London, 15.55-19.07, G., 4, Chattaway.
M.A., Spad, F-ADAE, Paris-London, 16.25-19.23, G.M., 2, Le Sec.

### JUNE 21st:

M.A., Breguet, F-CMAM, London-Paris, 10.08-12.40, G., Nil, Delage.
K.L., Fokker, H-NABJ, London-A'dam, 12.00-16.00, G.M., 1, Duke.
I.L., DH18, G-EAWO, London-Paris, 10.25-12.41, Nil, 7, Robins.
S.N., DH4, O-BARI, London-Brussels, 12.29-14.34, G.M., 1, Van Opstal.
G.E., Goliath, F-FHMU, London-Paris, 13.00-15.35, G.M., 12, Gaston & 1.
H.P., HP, G-EATN, London-Paris, 13.40-16.15, Nil, 5, Rogers.
M.A., Spad, F-ADAE, London-Paris, 16.03-18.10, Nil, 4, Le Sec.
S.N., DH9, O-BELG, Brussels-London, 08.45-11.27, Nil, 1, Catta.
S.N., DH9, O-BATA, Brussels-London, 12.08-15.00, G.M., 1, Sahnovsky.
G.E., Goliath, F-FHMY, Paris-London, 12.45-16.13, G., 11, Bechler & 1.
M.A., Salmson, F-CMAE, Paris-Ldn, 12.50-16.03, G.M., Nil, Charpentier
K.L., DH9, H-NABO, A'dam-London, 14.00-16.50, G.M., Nil, Holmes.
I.L., DH18, G-EAWO, Paris-London, 16.00-18.45, G., 8, Robins.
M.A., Spad, F-ACMC, Paris-London, 16.34-16.07/22nd, Nil, Nil, Paille.

### JUNE 22nd:

K.L., DH9, H-NABO, London-A'dam, 10.08-13.30, G.M., Nil, Holmes.
M.A., Spad, F-ACMF, London-Paris, 10.10-13.20, G., 3, Rauge.
I.L., DH18, G-EARO, London-Paris, 10.40-12.55, G.M., 7, Chattaway.
S.N., DH9, O-BATA, London-Brussels, 12.30-14.35, G.M., 2, Sahnovsky.
S.N., DH9, O-BELG, London-Brussels, 12.30-14.35, Nil, 2, Catta.
G.E., Goliath, F-FHMY, London-Paris, 12.45-15.05, G.M., 7, Bechler & 1.
M.A., Salmson, F-CMAE, Ldn-Paris, 16.06-18.30, G., 1, Charpentier.
M.A., Breguet, F-CMAR, Paris-London, 09.51-13.19, M., 4, Robyn.
H.P., HP, G-EATN, Paris-London, 11.15-14.58, Nil, 5, Rogers & 1.
H.P., HP, G-EATK, Paris-London, 11.16-15.03, Nil, 5, McIntosh & 1.
S.N., DH4, O-BARI, Brussels-London, 12.15-15.20, G.M., 1, Grandjean.
G.E., Goliath, F-GEAI, Paris-London, 12.45-16.00, G., 6, Favreau & 1.
M.A., Spad, FCMAY, Paris-London, 12.58-15.44, G.M., Nil, Raven.
K.L., Fokker, H-NABT, A'dam-London, 14.00-17.10, G.M., 2, Hofstra.
M.A., Spad, F-ACMH, Paris-London, 16.10-18.55, G.M., 1, Perignon.

### JUNE 23rd:

K.L., Fokker, H-NABT, London-A'dam, 10.07-13.30, G.M., Nil, Hofstra.
I.L., DH18, G-EAWO, London-Paris, 10.27-12.45, G., 8, Robins.
M.A., Breguet, F-CMAR, London-Paris, 10.39-13.05, Nil, 3, Robyn.
S.N., DH4, O-BARI, London-Brussels, 12.30-14.33, G.M., 2, Grandjean.
G.E., Goliath, F-GEAI, London-Paris, 12.40-15.00, G.M., 13, Favreau & 1.
M.A., Spad, F-ACMC, London-Paris, 16.09—, Nil, 4, Paille.
M.A., Spad, F-ACMH, London-Paris, 16.08-18.35, G., 3, Perignon.
M.A., Breguet, F-CMAQ, Paris-London, 09.25-12.00, G.M., 1, Delage.
I.L., DH18, G-EARO, Paris-London, 11.55-14.28, G., 4, Chattaway.
M.A., Breguet, F-CMAK, Paris-London, 12.35-15.26, G.M., Nil, Donelin.
K.L., Fokker, H-NABT, A'dam-London, 14.41-18.07, G.M., 3, Duke.
I.L., DH18, G-EAWO, Paris-London, 16.05-18.40, G., 8, Robins.
M.A., Spad, F-ADAE, Paris-London, 16.14-19.10, M., 5, Rauge.
G.E., Goliath, F-GEAC, Paris-London, 17.00-20.29, G., 9, Gaston & 1.
S.N., DH9, O-BATA, Brussels-London, —20.30, G.M., 2, Catta.

### JUNE 24th:

M.A., Spad, F-CMAQ, London-Paris, 09.57-12.20, G., 3, Delage.
K.L., Fokker, H-NABT, London-A'dam, 10.20-14.05, G.M., Nil, Duke.
I.L., DH18, G-EAWO, London-Paris, 10.30-12.45, Nil, 8, Chattaway.
I.L., Vimy, G-EASI, London-Paris, 10.35-13.25, G.M., 11, Robins.
S.N., DH9, O-BATA, London-Brussels, 12.25-14.15, G.M., 2, Catta.
G.E., Goliath, F-GEAC, London-Paris, 12.45-15.40, G.M., 11, Gaston & 1
M.A., Spad, F-ADAE, London-Paris, 16.09-18.40, Nil, 4, Rauge.
M.A., Breguet, F-CMAC, Paris-London, 10.05-12.56, Nil, 1, Portal.
M.A., Breguet, F-CMAM, Paris-London, 10.14-12.56, G.M., 3, Delily.
G.E., Goliath, F-GEAI, Paris-London, 10.15-13.19, G., 9, Labouchere & 1
H.P., HP, G-EATM, Paris-London, 11.00-13.54, Nil, 4, Wilcockson.
S.N., DH4, O-BALO, Brussels-London, 12.03-14.38, G.M., 2, Sahnovsky.
M.A., Breguet, F-CMAD, Paris-London, 12.45-15.40, G.M., Nil, Perignon.
G.E., Goliath, F-FHMY, Paris-London, 12.58-15.41, G., 4, Bechler & 1.
K.L., Fokker, H-NABH, A'dam-London, 14.00-16.55, G.M., 2, Hofstra.
G.E., Goliath, F-FHMU, Paris-London, 15.40-18.30, Nil, 1, Favreau & 1
I.L., Vimy, G-EASI, Paris-London, 16.00-18.45, G., 3, Chattaway.
M.A., Spad, F-ACMH, Paris-London, 16.30-19.05, G.M., Nil, Charpentier.

### JUNE 25th:

K.L., Fokker, H-NABH, London-A'dam, 10.00-14.04, G.M., 2, Hofstra.
M.A., Breguet, F-CMAC, London-Paris, 10.05-13.25, Nil, 4, Portal.
M.A., Breguet, F-CMAK, London-Paris, 12.10-15.20, Nil, 3, Donelin.
G.E., Goliath, F-FHMY, London-Paris, 12.44—, M., 12, Bechler & 1.
G.E., Goliath, F-FHMU, London-Paris, 12.45-15.15, Nil, 12, Favreau & 1.
M.A., Breguet, F-CMAD, London-Paris, 13.20-16.17, Nil, 3, Perignon.
I.L., Vimy, G-EASI, London-Paris, 13.20-16.40, G., 8, Barnard.
D.H., DH9, G-EAVK, London-Cherbourg, 13.55—, Nil, 2, Cobham.
G.E., Goliath, F-GEAI, London-Paris, 15.40—, Nil, 10, Labouchere & 1.
S.N., DH4, O-BALO, London-Brussels, 15.27-17.58, G.M., Nil, Sahnovsky.
M.A., Breguet, F-CMAM, London-Paris, 16.11-19.05, Nil, 3, Delily.
M.A., Spad, F-ACMH, London-Paris, 16.23-19.15, G., 2, Charpentier.
M.A., Breguet, F-CMAQ, London-Paris, 17.57-20.45, Nil, 3, Delage.
M.A., Breguet, F-ADAH, London-Paris, 17.57-20.30, Nil, 3, Robyn.
M.A., Breguet, F-ADAH, Paris-London, 09.30-11.40, G.M., Nil, Robyn.
M.A., Breguet, F-CMAQ, Paris-London, 10.15-12.15, Nil, 2, Delage.
S.N., DH9, O-BATA, Brussels-London, 11.48-14.12, G.M., 2, Grandjean.
I.L., DH18, G-EAWO, Paris-London, 12.05-14.12, Nil, 2, Robins.
G.E., Goliath, F-GEAB, Paris-London, 12.35-15.04, G., 2, Gaston & 1.
M.A., Spad, F-ACMD, Paris-London, 12.45-14.56, G., 1, Briere.
K.L., Fokker, H-NABJ, A'dam-London, 14.42-17.45, G.M., 1, Holmes.
M.A., Spad, F-ADAE, Paris-London, 16.07-18 16, G.M., 3, Rauge.
I.L., Vimy, G-EASI, Paris-London, 17.45-20.04, G., 2, Chattaway.

### JUNE 26th:

I.L., Vimy, G-EASI, London-Paris, 09.20-12.00, G., 11, Powell.
I.L., DH4, G-EAMU, London-Paris, 11.00-13.10, Nil, 2, Barnard.
M.A., Spad, F-ADAE, London-Paris, 11.08-14.10, Nil, 3, Rauge.
D.H., DH9, G-EAVK, Cherbourg-London, —14.47, Nil, Nil, Cobham.
I.L., DH4, G-EAMU, Paris-London, 18.12-20.38, G., 1, Barnard.

## Inland Flying at Croydon.

June 20th.—B.A.C. Bristol to Bristol (Uwins); H.P.T. HP to Cricklewood (McIntosh).

June 21st.—H.P.T. HP Martlesham return (Perry); H.P.T., two HPs to Cricklewood (Rogers and McIntosh); S.F.S. Avro joy-rides (Muir); I.L. DH4 to Belfast (Barnard).

June 22nd.—S.F.S. Avro joy-rides (Muir); I.L. DH4 from Belfast (Barnard).

June 23rd.—S.F.S. Avro joy-rides (Muir); H.P.T. HP to Cricklewood (Wilcockson).

June 24th.—H.P.T. DH4 Liverpool return (Rogers).

June 25th.—H.P.T. three HPs to Cricklewood (Wilcockson, Perry, McIntosh), I.L., DH18 test (Chattaway), then to Lympne; Vimy to Lympne (Barnard), DH18 from Lympne (Barnard); H.P.T., DH4 to Cricklewood (Rogers); S.F.S, Avro joy-rides (Muir); D.H. DH9 to Stag Lane (Cobham).

June 26th.—S.F.S. Avro joy-rides (Muir); D.H DH9 to Stag Lane (Cobham).

## Air Port Statistics.

CONTINENTAL.

Machines, 105; Passengers, 381; Crews, 122; Total Personnel, 503

This does not include a few H.P. passengers starting from Cricklewood.

*Corresponding week last year:—*

Machines, 113; Passengers, 217; Crews, 122; Total Personnel 339

## The London Terminal Aerodrome.

A record week of flying at the aerodrome. There was a steady flow of machines all the week, culminating on Saturday, when 26, including three H.Ps. which hopped over to Cricklewood that they might there pick up passengers, used the terminal. One of the three H.Ps. sustained slight damage in landing at Cricklewood and another descended at Dartford on its outward journey. Doubtless under the new management such things will not occur in future.

It was most noticeable that day how machines sank over Purley Valley, chiefly owing to the lack of lift, probably due to the cauldron-like state of the air.

It was a wonderful sight to see the "Goliaths" loaded with twelve passengers and a pilot and mechanic, take off well after a short run, and climb at a steep angle instead of just staggering off the edge of the aerodrome like some machines. These at first despised avions have now proved themselves the most economical commercial machines at Croydon. If only they had windows that would open —!

In the afternoon a party of French senators (those who, as Mr. Muir puts it, read the aeronautical publications such as the *Daily Mirror*, will know that they had arrived by air on a "propaganding" joy-ride the previous day) departed *en avion* "Goliath."

One noticed among the crowd of senators gathered round the *avion* one whose head and shoulders towered over the senators and the "Goliath." This was he to whom M. le Baron d'Estournel de Constant, President of the Senate, alluded on account of his youthful appearance as the "Sous-Lieutenant-Général" Festing, our respected Controller of Aerodromes and Licences.

The machine left the ground about 15.30, in the capable hands of M. Labouchère, who is probably the oldest pilot in civil or any other aviation as regards length of years he has been flying. It will be remembered that he is a cousin of the late M. Hubert Latham. As the leave-takings proceeded one felt how much a Frenchman must regret having only two hands to shake.

The horse pilot, Mr. Donoghue, and a Mr. Bullock, in the same trade, arrived by air from Paris and shortly after went off in Mr. Hearn's Renault-Avro to Newmarket. Mr. Donoghue is becoming quite a habitué of the aerodrome.

### The Instone Air Line.

Another visitor to the aerodrome on Saturday was Sir Samuel Instone, hot from a visit to H.M. the King, who had bestowed his new knighthood upon him that morning.

Mr. Game has been carrying on the good work of ensuring the supply of pilots, as will be seen from the personal notices in this paper. It has not yet been decided when the new arrival will be given his first coat of the now well-known "Instone Blue."

By the way, the report that the I.A.L. were determined to paint the Oxonian machines for the coming race is unfounded; nor are they to be allowed to dilute their colouring for the benefit of Grantabridgia.

Mr. Barnard flew to Belfast on Tuesday, returning with photographs of the opening of the Ulster Parliament on Wednesday, having made the trip, including a twenty minutes' stop at Manchester, in 3½ hours.

On Saturday Mr. Chattaway had trouble with the radiator of a D.H.18. He eventually got away with eight passengers, but had to land at Lympne. Mr. Barnard went off at once, on hearing the trouble, with the "Vimy," to which machine the pilot and passengers were transferred. Mr. Barnard returned to Croydon on the "18," coming in from a considerable height with a long spiral glide. The "Vimy" returned in the evening.

Mr. Powell went over on the "Vimy" on Sunday morning with spectators and jockeys for the Grand Prix. He left on the return journey in the evening, but ran into dense fog on leaving the French coast. He made about three attempts to get through and finally landed for the night at St. Inglevert. He left again at 06.00 the following morning, arriving at Croydon at 07.10.

### The Surrey Flying Services.

Mr. Muir has been busy during the week, and on Saturday and Sunday he carried nearly 100 passengers.

One learns that the Surrey Flying Services will be responsible for the upkeep and maintenance of the Royal Aero Club's machines, the first of which are due at the aerodrome next Friday. One gathers that this includes the machines for the 'Varsity Race. The R.Ae.C. is to be congratulated on its excellent choice.

Mr. Muir intends to send a machine away to the seaside, probably this week, now that the holiday season is in full swing.

### The Flying Dutchmen.

On Monday evening of this week, as one was leaving the aerodrome, one saw a D.H.9 evoluting in such a manner that it could only have been Mr. Hinchcliffe, who evidently arrived in the Fokker of Mr Duke.

### Handley Page Transport.

Handley Page Transport have been sending their machines to Martlesham to be weighed, pending the possible raising of the number of passengers in their airworthiness certificate. Machines on being weighed have been found to differ from one another by as much as 500 lb., one is told. Hence that sinking feeling.—G. D.

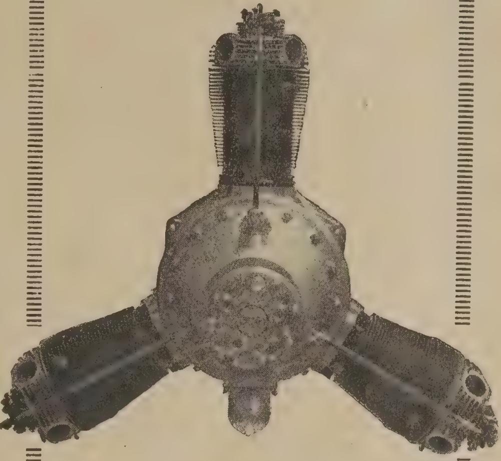
### The Higher the Fewer.

The following letter has been received :—

Sir,—As a constant reader of your Aeroplane book I feel it my duty to make known to you the following case which in my opinion only goes to show the way that men such as I are in nearly every case prevented from gleaning the knowledge at present so necessary to the man in the street if we are to survive, as I trust we shall, this time of crises in the life, young as it is, of civil aviation in this country.

Noticing a large erection west of Croydon Aerodrome I approached it, wondering what the use of so large a scaffolding could be. On reaching it I found it to be a number of

The 100 H.P.
"Bristol"
LUCIFER
Aero Engine



This engine combines simplicity of design, ease of assembly, reliability and long life with the numerous advantages incidental to an air-cooled engine.

It may be relied upon to run for long periods without overhauling or dismantling, while its general all-round performance and reliability compare favourably with the modern motor-car engine. For use in training, sporting and small commercial aircraft it is the ideal power unit.

*For further particulars write to—*

The Bristol Aeroplane Co., Ltd.
FILTON—BRISTOL.
*Telegrams—Aviation, Bristol.* *Telephone—3[illegible]6 Bristol.*

cross pieces of wood held together with nails and kept in an upright position by several pieces of wire. Still being ignorant as to its use I advanced towards a gentleman who seemed to be in charge in order to glean something as to the use of the erection.

On approaching this gentleman I discovered he was stoking cheese and bread into a cavity which, although it was hidden by an antediluvian growth, I took to be his mouth. I asked in my usual courteous manner the nature of the adjacent building. My question was met with a Pipilian growl of a cheesy nature.

Somewhat taken aback I repeated my query and was this time honoured with a reply, bearing the mark of the lower orders and of cheese it is true, but at least distinct, informing me that was a flaming mast.

Having delivered himself of this news item my mossy-faced friend resumed his meal. I was unaware what a flaming mast was, but concluded it was to facilitate the landing of machines in fog or at night.

Now, Sir, my point is this. Why could not my friend of the cheese have told me this at first, and furthermore have enlightened me as to the actual functioning of the ideas? The mast, I have since discovered, is for testing bombs which are allowed to slide down the wires. Apparently my source of information was, in the first place, incorrect, or else I did not hear him well enough owing to the food he was devouring. It seems that nobody has told the officials at Croydon that it is rude to talk with their mouths full. Really the lack of education of our modern Civil Servants, among whom Air Ministry officials must be included, is deplorable. I am losing my faith in our public schools.

But if my questions had been answered civilly, as I gave them, then how much more pleasant things would have been.

(Signed) Disgusted.

## A Mishap to R.36.

On Tuesday, June 21st, a serious mishap befell R.36 (G-FAAF) at Pulham. She had been out for a short flight and in coming up to the mooring mast a gust of wind carried her over the head of the mast. The sudden pull on the mooring cable, which was stretched taut, strained the forward end of the frame of the vessel, so that it was decided to house her. The R.36 was detached from the cable and brought to the ground in safety, but when being taken into the shed her bows fouled the wall and were damaged, as was her side.

It is apparent that the accident was due to lack of proper material, which lack is due to the continual bleat for economy, the effect of which is entirely lost when such accidents as the above occur. Had the mast been fitted with the proper winding gear the mishap would not, in all probability, have occurred.

The injuries to the R.36 are not vital, but as there are so few men on the constructional staff at Pulham it may take some time to get the repairs done.

Meantime the Zeppelin L.64 has had to be wrecked to make room in the Pulham shed for R.36 as there was nowhere else to put either ship.

## British Register of Aircraft.

Additions during May, 1921:—No. 653, G-EAUS, D.H.6, 80-h.p. Renault; No. 654, G-EAUT, D.H.6, 80-h.p. Renault, Blackpool Flying Service; No. 655, G-EAWW, D.H.18, 450-h.p. Napier "Lion"; No. 656, G-EAWX, D.H.18, 450-h.p. Napier "Lion," De Havilland Aircraft Co.; No. 657, G-EAWY, Bristol 10-seater, 450-h.p. Napier "Lion," Bristol Aeroplane Co.; No. 658, G-EARR, D.H.6, 90-h.p. R.A.F.1a, C. Hudson; No. 659, G-EAWZ, Bristol Fighter, 300-h.p. Hispano-Suiza, Aircraft Disposal Co. Ltd.; No. 660, G-EAXA, Bristol Tourer 2-seater, 230-h.p. Siddeley "Puma," Bristol Aeroplane Co. Ltd.; No. 661, G-EAJK, Avro 504K, 110-h.p. Le Rhone, Vulcan Aviation Co. Ltd.: No. 662, G-EAFH, Avro 543, 80-h.p. Renault, Welsh Aviation Co. Ltd.; 663, G-EANQ, Avro 504K, 110-h.p. Le Rhone, Messrs. Ingham and Little.

## Brooklands.

There were some extraordinary bargains at the final clearance sale at the Disposals Board Central Stores Depot, No. 236, at Brooklands, held on June 15th. Partially dismantled aeroplanes, 56 in all, of various types, 200 sets of wings, 100 air screws, and sparking-plugs and quantities of miscellaneous stores were disposed of at ridiculous prices. An armoured Sopwith "Salamander" was sold for 8s., while another realised the highest sum paid during the sale, 18s. Two Sopwith "Camels" were sold for 20s., 13 Bristol "Fighters" for 11s. each, 11 D.H.4s for 12s. each, and three "Dolphins" at 12s. 6d., 15s. and 16s. each! 2,800 steel Rafwires were sold for 6s. the lot. O devastating peace!—J. H. S.

## Stag Lane.

An American, Mr. Baird, at 12.30 on Saturday, was recalled urgently to America. He found that the only immediately leaving ship was the *Aquitania*, and she had left Southampton at 10.00, but was due to leave Cherbourg at 18.30.

Mr. Baird, through Mr. Loader of the LepAerial Travel Bureau, fixed up a machine, a D.H.9, which left Stag Lane, the lair of the De Havilland Aircraft Co., at 13.00. She went *via* Croydon and St. Inglevert and landed at Cherbourg on a field which Mr. Alan Cobham the pilot told one was about three times as big as a tennis court. The boat was duly caught by Mr. Baird (or same in active voice as Latin exercise books say) and Mr. Cobham returned on Monday.

Earlier in the week Mr. Cobham and Mr. Hatchett both flew to Belfast to bring back photographs of H.M. The King opening the Ulster Parliament. They came back together in good time.

Mr. Hearn on his Renault-Avro also made the trip to Belfast and back.—G. D.

## The Welsh Aviation Company, Limited.

The Welsh Aviation Company, which has for some time been operating in the west, now hold flying rights and licensed sites at the following places:—Swansea, Aberavon, Porthcawl, Tenby, Llanwrtyd Wells, Builth Wells, and Llanelly (pending).

During the past few weeks the four first-named places have been visited. Owing to the present industrial situation, business has been moderate, except at Porthcawl, where nearly 200 passengers have been taken each week-end, the machines returning to Swansea at night.

One machine is to be stationed at Tenby and one at the Wells, while the other places are visited on set days each week. It is hoped, later in the season, to give exhibitions at Gloucester, Cardiff, and Hereford. A certain number of Fairs have booked machines to carry pasesngers, as an additional attraction.

Cross-country flights are carried out at the rate of 1s. 3d. per mile per person, and the short flights are given from 7s. 6d.

A number of orders have been booked during the winter for aerial photographs to be taken of works, collieries and docks. These are being carried out as time and weather permit. One machine is at present at Liverpool fulfilling orders.

With a view to raising a certain amount of enthusiasm, and collecting crowds, advertised exhibitions of stunt flying are being given, in conjunction with joy-riding.

These are carried out on a Sopwith "Camel," and have been given at Swansea and Porthcawl. One has been given in aid of the Mayor's Unemployment Fund. As nothing of this kind has been seen before in Wales, they have been much appreciated, and some of the local papers have had the time of their lives. The machine is the property of Mr. Broad, who is under contract with the Company, and flies his machine himself.

The Company has at present five Avros, two with Renault engines. This number will be increased if required.

# AIRCRAFT IN PARLIAMENT

On June 14th, in his speech on the Middle Eastern question, Mr. CHURCHILL made the following references to the Royal Air Force in Mesopotamia:—"Last of all is our arrangements for maintaining public security, but by no means least of all, comes the powerful Air Force which is now stationed in the country. There are at present six squadrons of aeroplanes in Mesopotamia, and next year there will be two more. The extent to which aerial control can be used in substitution of military force is still disputable, but with every month that has passed our confidence in its great utility has been increased. It must not be supposed that aeroplanes have no means of acting except by using lethal force. That, of course, is in reserve. But we hope that, by their agency, we shall be able to keep in amicable touch with the tribes and local centres, and to ward off in good time movements of unrest, to sustain and, if necessary, relieve detached posts, to keep political officers in close relation with their districts and to maintain a reasonable degree of order in the country.

"There is also a squadron of the Air Force in Palestine, and three squadrons in Egypt.

"Arrangements are being made which will make it possible for aeroplanes to fly regularly to and fro across the desert between Bagdad and Cairo. At the present time if you wish to move a squadron from Egypt to Mesopotamia or *vice versa* the aeroplanes have to be taken to pieces at the port, packed in crates and taken on a long sea voyage, a process which takes two or three months at the least. But once this route across the desert has been marked out the whole of the Air Force in Mesopotamia can be speedily transported to Palestine or Egypt or *vice versa*.

"That may in the end be used as a means of securing a reduction of the aggregate number of squadrons we shall have to employ. I am, of course, counting on the friendly sentiment in the desert. That is the whole policy. It is to develop a friendly policy with the Arabs to keep in close touch and sympathy and sentiment with them.

"I should mention that as all this Air Force has to be on the ground for the purposing of maintaining peace and order arrangements can be made to fly a certain amount of commercial aeroplanes which can carry mails and possibly passengers, and incidentally will, if we have a peaceful solution at which we are aiming, afford a most valuable link in the chain of Imperial communications which may ultimately result in very great advantage in shortening communication with India and with Australia and New Zealand."

Replying to Colonel WEDGWOOD, who wanted to know how much of the £7,000,000 or £8,000,000 asked for military purposes is for the Air Force, Mr. Churchill said: "About £1,250,000, for the Air Force, and the rest for levies and certain subsidies"

# PERSONAL NOTICES.

[Ex-officers and men of the Royal Air Force are invited to send notices for the Personal Columns of THE AEROPLANE There is no charge for the insertion of these notices, as it is considered that they are very interesting items of news and tend to keep past and present members of the Flying Services in touch with one another.]

## DEATHS.

ANSTEY-BENNETT.—On June 7th, at Teignmouth, Capt. Lionel Anstey-Bennett, late Oxfordshire Light Infantry and R.A.F., of Castle Roe, Coleraine, and Beatticombe, Hatherleigh, beloved son of the late Rev. Edmund Anstey-Bennett.

BEAUCHAMP-PROCTOR.—On June 21st, at Upavon, as the result of an accident whilst flying, Flt. Lieut. Andrew W Beauchamp-Proctor, V.C., D.S.O., M.C. and Bar, D.F.C.

The death of Mr. Beauchamp Proctor will be a great blow to all who knew him. The cause of the accident appears fairly clear. He was flying a "Snipe" in practice at the Central Flying School, and being of small stature he had packed his seat with two extra cushions. After flying for a time he did a slow loop, hanging with the machine upside down on the top of the loop. It was then noticed that the cushions fell out. The machine thereafter spun for two or three turns on its back, came out of the spin right side up, started another spin in the opposite direction, went onto its back again, and then dived into the ground.

The assumption is that when hanging at the top of the loop he left his seat and then owing to the loss of the cushions was unable to reach his controls when the machine came momentarily into its proper position.

The obvious lesson is that even the most successful pilots should make perfectly sure that there is no possibility of their being thrown away from their controls when doing acrobatic flying.

Mr. Beauchamp Proctor was born at George, near Cape Town, but spent his early life in Mafeking. He was awarded the V.C. on November 30th, 1918, the official announcement stating that between August 8th, 1918, and October, 1918, he proved himself victor in 26 decisive combats. In all he succeeded in destroying 22 enemy aeroplanes and 16 enemy kite balloons, and drove down 16 enemy aircraft completely out of control, a total of 54.

He was awarded the Military Cross on June 22nd, 1918, the D.F.C. on July 2nd, 1918, a bar to the M.C. on September 16th, 1918, and the D.S.O. on November 2nd, 1918.

COOMBS.—At Heliopolis, on June 8th, as the result of a flying accident, Flying Officer H. Milbourne Coombs, D.F.C.

DODKINS.—On June 13th, at R.A.F. Hospital, Finchley, of malaria, contracted on active service in India and N.W. Frontier, Flying Officer Lionel C. Dodkins, late 31st Squadron, R.A.F., aged 25.

GREENWOOD.—At Buenos Aires, on June 13th, as the result of a flying accident, Percy M. Greenwood, late R.A.F.

HAWKINS.—At Gloucester, N.S.W., on June 12th, as the result of a flying accident, Capt. Henry Ryder Hawkins, M.C., Legion of Honour, late R.A.F.

STRUBEN.—On June 24th, at Folkestone, as the result of a flying accident, Flying Officer H. M. Struben, 25 Squadron, R.A.F.

## ENGAGEMENTS.

LORAINE—STRANGMAN.—The marriage of Lt.-Col. Robert Loraine, D.S.O., M.C., and Winifred Lydia, elder daughter of Sir Thomas and Lady Strangman, of Bombay, now at 12, Cork Street, W., will take place on Thursday, July 14th, at St. George's, Hanover Square, at 14.30.

RUSSELL—BULLEN-LUND.—The engagement is announced between Flt. Lieut. Arthur L. Russell, R.A.F., son of Mr. A. Russell, of Powerscourt, Brighton, and Octavia Mary, youngest daughter of Mrs. Bullen-Lund, 4, Helena Court, St. Leonards-on-Sea, and the late Lieut. W. Bullen-Lund, R.A.S.C., and Stock Exchange.

STRINGER—OMPTEDA.—A marriage has been arranged, and will shortly take place, between Major C. H. Stringer, D.F.C., late 5th Royal Irish Lancers, second son of Mr. G. E. Stringer, Barton Hall, Kettering, Northamptonshire, and Lorie Baroness v. Ompteda, widow of Robert, Baron v. Ompteda, and fifth daughter of the late Hon. W. and Mrs. Winter Irving.

## MARRIAGES.

BAYLEY—TANKERVILLE-CHAMBERLAYNE.—On June 18th, at All Saint's Church, Cairo, Egypt, by the Rev. P. C. C. Lamb, M.A., A. Cyril Bayley, Lieut., R.A.F., only son of Mr. and Mrs. A. Bayley, to Mary Evelyn, youngest daughter of Mr. and Mrs. Tankerville-Chamberlayne, of Cranbury Park, Hants.

BETTINGTON—WRIGHT.—On June 14th, at Christ Church, Stafford Street, by the Rev. George Mould, Rector, Wing-commander Vere Bettington, C.M.G., R.A.F., and Florence Evelyn, daughter of the late Sir William S. and Lady Wright, of the Holt, Scalby, Yorks.

MAJOR—WINTERTON.—On June 22nd, at St. Peter's Church, Oadby, Leicestershire, by the Rev. C. O'Connor Fenton, Capt. Gerald Hewitt Major, R.A.F., eldest surviving son of Charles Major, J.P., and the late Mrs. Major, of Wembdon, Bridgwater, Somerset, to Phyllis Mary, younger daughter of William Henry Winterton, J.P., and Mrs. Winterton, of The Knoll, Oadby.

THOMSON—CAYLEY.—On June 16th, 1921, at Holy Trinity Church, Brompton, S.W.1, by the Rev. Herbert Gaussen, Sqdn. Ldr. George Thomson, O.B.E., R.A.F., son of the late Major J. Thomson and Mrs. Thomson, Runwell, Essex, to Octavia, youngest daughter of the late Mr. and Mrs. Digby Cayley, of Norton Grove, Malton.

## BIRTHS.

ALFORD.—To Rosalie, wife of Flt. Lieut. F. R. Alford, M.C., R.A.F. —a son.

CHATTAWAY.—At South Norwood, on June 6th, the wife of H. W. Chattaway, late R.F.C., and now of the Instone Air Line—of a son.

GAME.—On June 24th, at 54, Elmwood Road, Croydon, to Peggy (nee Robins), wife of Capt. H. F. Game, late R.F.C. and now of the Instone Air Line, of a son

HIBBERT.—On June 17th, at 13, St Peter Street, Winchester, to Margaret, wife of Capt J. E. Hibbert, M.C., D.F.C.—a daughter.

MEERS.—On June 14th, at The Red House, Bickley, Kent, Norah (nee Gunn), the wife of Rupert Hart Meers, M.A., late Capt., R.A.F., of a son.

O'BRIEN.—On June 14th, at 4a, Moreton Terrace, S.W.5, the wife of Major A. K. O'Brien, late Queen's Bays and R.A.F., of Lumbwa, Kenya Colony—a daughter

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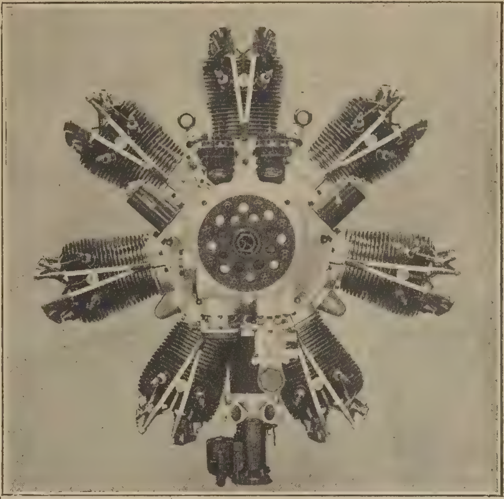

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## INDEX TO ADVERTISERS

Accles & Pollock, Ltd. ... ... ... *Back Cover*
Aircraft Disposal Co., Ltd., The ... ... 586
Armstrong Siddeley Motors, Ltd. ... ... 599
Arrol-Johnston, Ltd. ... ... ... *Front Cover*
Auster, Ltd. ... ... ... ... ... ... *Front Cover*
Bristol Aeroplane Co., Ltd. ... ... ... 597
British Thomson-Houston Co., Ltd., The ... 586
Calthrop, E. R., Aerial Pat., Ltd. ... *Back Cover*
Cellon, Ltd. ... ... ... ... ... ... *Front Cover*
Cunard Line ... ... ... ... ... ... ... 600
De Havilland Aircraft Co., Ltd., The... ... 593
Fairey Aviation Co., Ltd., The ... ... ... 585
Hancock, James Lyne, Ltd. ... ... ... 600
New Pegamoid, Ltd. ... ... ... ... ... 600
Palmer Tyre, Ltd. ... ... ... ... ... ... 589
Parnall, G., & Co. ... ... ... ... ... 593
Roe, A. V., & Co., Ltd ... ...*Inside Front Cover*
Short Bros., Ltd. ... ... ... ... *Back Cover*
Titanine, Ltd. *Front Cover & Inside Back Cover*
Westland Aircraft Works... ... ... ... 591

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